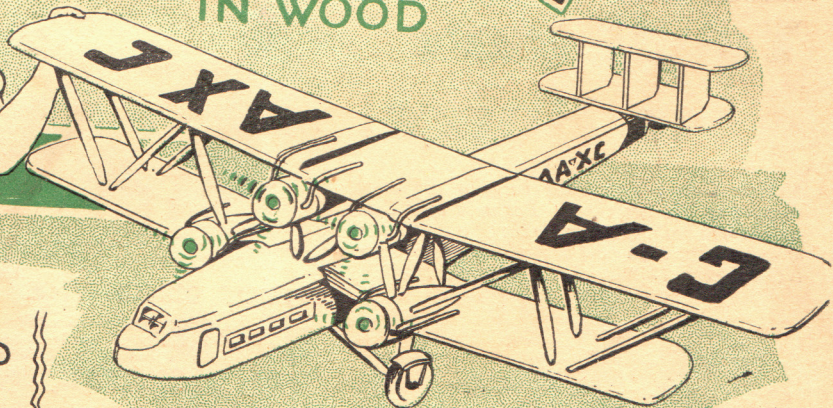
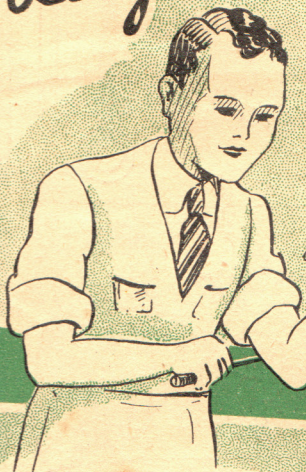


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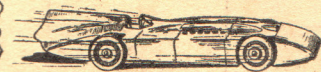
WEEKLY

Large design chart for making a

**MODEL
AIR LINER!**
IN WOOD



*And the
BLUE BIRD*



March 16th. 1935

4^D

Vol. 79. No. 2056

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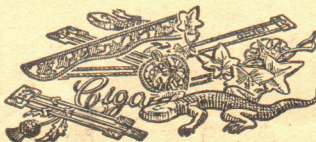
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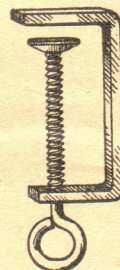


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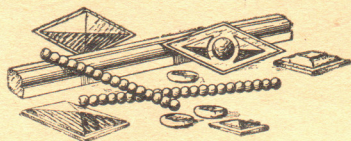
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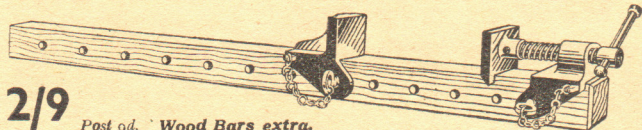


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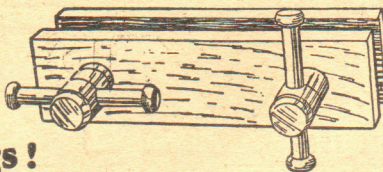
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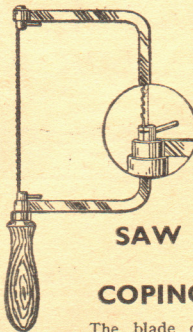
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Convert your kitchen table into a bench. Easily fixed with a couple of screws. This Vice is made of beech, with hardwood screws.



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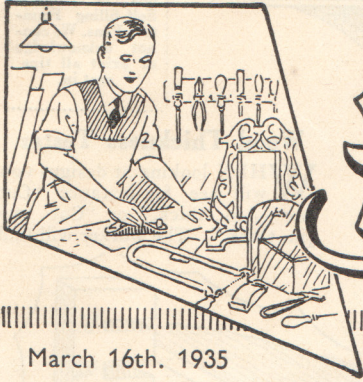
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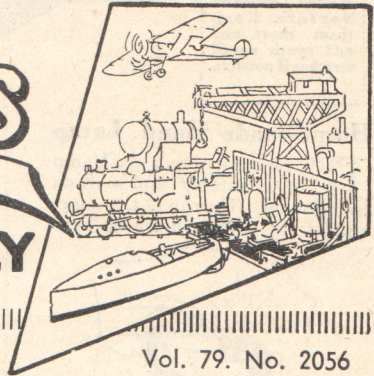
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ENLARGED SPRING NUMBER



Hobbies WEEKLY



March 16th. 1935

Letters should be addressed to
The Editor, Hobbies Weekly,
Dereham, Norfolk.

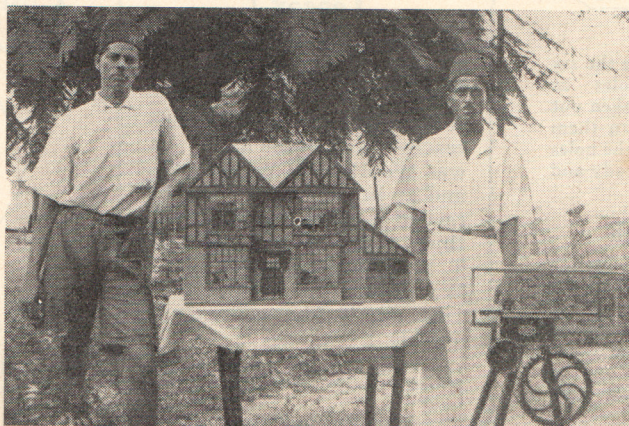
Vol. 79. No. 2056

IN offering you this Enlarged Number, I do so with a feeling of great pleasure, because I know it is one of the best and finest which has ever been produced! We keep ahead of the times and in the marvellous model of the Air Liner, you have something right up to the minute in model-making. There is a design chart double-size and pages and pages packed with interest. You certainly cannot say there is not value for money.

THE weekly features we have on Popular Science, Cycling, Scouting, etc., are proving very popular, and an amazing amount of interest will be found, even if you are not really keen on the particular subject. I think we must have a competition as to which one you like best.

TALKING of Competitions, reminds me of the "Angles" one in this issue. We had one like it several years ago now, and it proved so popular then that I feel it worthy of repetition. You can really get no end of fun and pass many a pleasant hour working out quaint characters from the shapes provided.

THIS week's photograph was forwarded by W. Crichton of Chirala, India, whom you see in the picture. These two keen readers completed the Doll's House with the machine shown and have since been at work on Empress of Britain.



A. G. ATHERTON of Taunton, Ashton-under-Lyne has a splendid workshop with bench, stove and lighting—quite suitable for a Hobbies Club in fact. So he kindly offers it for the use of other readers in the district if they will get in touch with him. His address is 1 Walton Street and he wants friends about 19 years of age.

NOTES of the WEEK

This Splendid Issue!—A Jolly Competition—Workers in India Clubs Formed for Readers—Have you the Albert Memorial?

ANOTHER Club is being held at Norwich in the senior department of The Norman School, Mile Cross. There are many members, whose interests are in those subjects we cover in these pages. Anyone interested should get in touch with the Club Secretary, Mr. John O. Boast at the School.

IF any reader has a very old copy of Hobbies Weekly with a small design for making the Albert Memorial in it, will he write to R. Peaty, at the White Horse Inn, Yeovil, Som.? That reader is very anxious to secure a copy, as he is undertaking to complete a range of models of all the more important buildings in London.

ANOTHER hobby which has a fascination for many is of utilizing spent or new matches to make models with. A Grimsby clerk has just made a replica of a school using matches cut down for bricks, and match box sides for tiles. This may suggest a new hobby for other readers with a steady hand and patience.

The Editor

Send your own simple tips to The Editor, Hobbies Weekly, Dereham, Norfolk. Keep them short and add rough pencil sketches if possible.

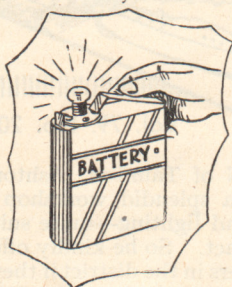
HINTS AND TIPS



For original Tips published the sender will receive one of Hobbies Self-filling Fountain Pens. We cannot acknowledge or print all tips sent in.

Home-made Hand Lamp

THE essentials are a flashlamp bulb, a battery and a china bulb-holder. The top of the short end of the battery must be bent



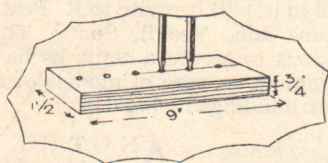
over; the other bent as in the picture. The bulb holder is pushed under the small one and then the bulb put in. Just press to light.

Cleaning Your Watch

BY opening the back of a watch, and pumping a few jets of air into the mechanism with a bicycle pump, all dirt can be removed and the watch often restored to normal—for nothing!

A Drill Case

OBTAIN a piece of thick wood and cut it to the dimensions shown on the diagram. Mark off 6 equal spaces, and draw a line



3/4 in. from the back. Take the six drill bits, drilling the holes as shown. When they are taken out of the brace or drill, turn them upside down and place in the holes again, where they will be ready and handy.

Marking a Catch

WHEN fitting a ball catch a simple way to find where the plate should be is to put a spot of grease or black shoe polish on the catch and then close the door. This will make a mark on the frame of the door. Then place the plate on that spot.

Removing Hammer Marks

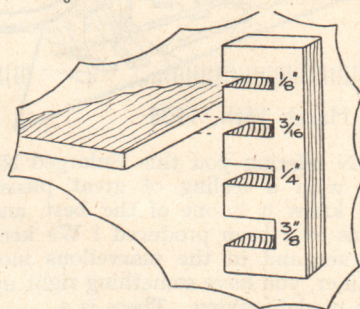
HAMMER dents made in wood when driving in nails may be easily removed if attended to at once. Wet the surface of the wood in and around the dent. The depressed part will swell out, leaving a flush surface. The mark made by the blow compresses the wood and when wetted it swells out again more freely than the surrounding wood.

"Stunt" Photographs on Linen

GET a saucerful of pure malt vinegar and thoroughly soak a print in it, face upwards. Leave the photo there for six or seven minutes. Now take a piece of close woven, white cloth (an old handkerchief will do), and lay it smoothly over a piece of flannel. Take the photo out of the vinegar, place it face downward on the cloth, and press it down with a hot iron, moving this about carefully until the photo is quite dry. You will find that the film has been transferred from the paper to the cloth and will not easily rub or even wash off.

Wood Thickness Tester

WHEN looking at designs you will see for instance "Cut one—3/8 in. thick," or "Cut two 3/4 in. thick." The worker will find



it useful to make a gauge as shown to slide over the edge of wood in order to test whether it is the thickness required. This gauge is easily cut in 3/8 or 1/2 in. wood and a hole can be put at the top for hanging handy near the bench.

Removing Hard Putty

HARDENED putty may be softened with a mixture of lye, (2 parts) and hard soap, (1 part). Dissolve with a little water and mild heat. When cold it should be like gelatine, if not add more soap. Apply this thickly to the putty and let it stand for a day or two. The softened putty is then easily removed.

A Five-Minute Teaser!

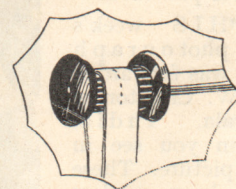
Here is an interesting and tricky little problem to keep you employed for a spare five minutes. It is not really difficult, but if you cannot solve it, ask your friends. Then look out for the answer next week.

A little boy was asked by his teacher to spell his name. It was Woottwuell W. Woodd, and as he was used to it he rattled it off at a great speed, thus: "W, double O, double T, W, double E, double L, W, W, double O, double D." Just see if you can say it quickly!

The answer to last week's motor and tyre problem was—The Car: 1 year; the tyres: 3/4 year!

Useful Pulley and Belt

A USEFUL pulley or wheel can be made to fit a small motor or engine shaft by fixing on it two



wireless knobs end to end. The sides of the knobs must be parallel to the shaft. A useful belt can be made of adhesive tape, doubled. This is superior to string and will not slip.

MODEL AIR LINER

A wonderful piece of work to undertake for exhibition. A special parcel of all necessary parts, with engine shapes turned, wood for base, wire for struts, etc., complete for 5/6 (postage 6d.) Suitable enamel is also supplied by Hobbies at 2d. a tin, in black, green and blue.

AEROPLANES are so much a part of our modern means of transport, we are not surprised at the number of requests received from readers for a model design. We have, therefore, been experimenting for some time in various types and styles, and have now produced what we believe, to be one of the finest models in wood of any machine.

We chose as the most popular type representative of English aviation, one of those huge air liners which regularly fly between Croydon and Le Bourget. It is one of the Imperial Airways machines of the Heracles type, and the lines of the model follow exceedingly closely to the actual prototype.

The Heracles

The machine itself is the Heracles, with four air-cooled engines each of 555 p.h.b. with accommodation for 20 passengers in the forward cabin and 18 in the aft. The interior, of course, is luxuriously fitted, being provided with kitchens, heating apparatus for passengers, and luggage accommodation.

The marking for the Heracles is G/AAXC. The span is 130 ft. and the height 27ft. 3ins. and weighs just over 13 tons when fully loaded. The speed is 130 miles an hour, and for comfort and reliability this particular type of biplane is unsurpassed anywhere.

on the large design chart of No. 194 Special. The whole

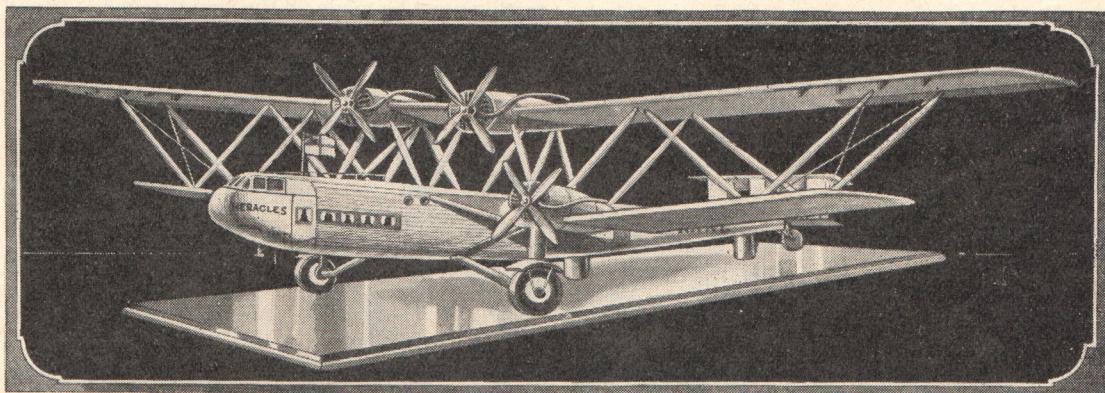
of the work is done with a very few tools, the principal, of course, being the fretsaw, with which one can cut out the various shapes.

The fuselage is cut in thick wood, and the wings, struts and elevators, etc., in quite thin stuff. There is really very little actual cutting to be done, but a considerable amount of shaping, as is only natural, to obtain the correct sweep, streamline, etc., required.

The model maker must be at pains to obtain all the parts the correct shape, and to have patience with file, rasp and glasspaper. The struts, for instance, between the planes must be nicely rounded the true shape, or an ugly effect will result. The same remarks apply to the wings, where the front and back edges are tapered off to reduce the wind resistance.

The Propellers

The propellers, too, are cut from one piece of wood, and then shaped up very carefully with a knife, file and glasspaper to the required shape. Wherever shaping is concerned, a sectional shaded portion is given on the pattern, which indicates the part as it would look if it were cut through. This gives exactly how it is to be shaped off in the various directions.



The model in wood has a span of 2ft. between wing tips and is 16½ins. nose to tail.

The model shown is built throughout in wood, and of course, is not intended to fly. Indeed, provision is made for it to stand on a suitable base.

The completed model is 24½ins. between wing tips, and 16½ins. from nose to tail. It stands 5ins. high. The making is greatly simplified by the numerous drawings and patterns given full size

The picture given of the actual Imperial Airways Model, and the line drawing of our own, gives numerous details which will be helpful in finishing.

The wood used should be some close-grained material which will not split, and which can be smoothed down to the shapes required. Sycamore

Model Air Liner—(continued)

or even Beech is suitable. In addition to the actual wood, there is of course, the wire required for the stays and thick brass wire for the engine exhausts.

As usual, Hobbies Ltd., supply a parcel in which all the wood required is provided, planed and cut ready to the sizes of the various patterns. In addition, there is a complete lot of the wire, whilst considerable trouble is saved by the actual engines being supplied as a solid block, turned the exact shape necessary.

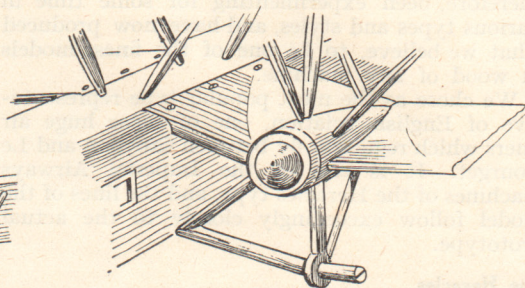
The Construction

This saves a good deal of trouble, for otherwise the model maker will have to cut and shape the parts out of a solid block of wood to the shape shown on the sheet.

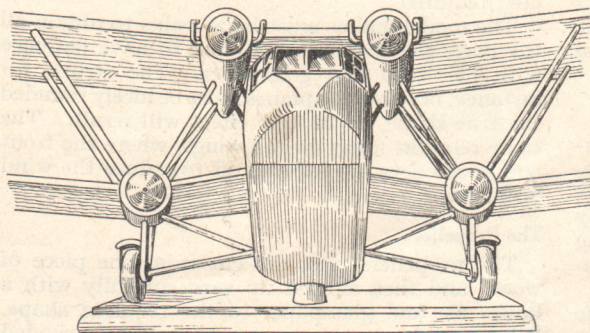
The actual construction is quite straightforward, but the worker must not be in too much hurry to

top over the upper edge. This box frame must be thoroughly strong, and can be strengthened with screws or nails because they will be covered later by paint. See, however, that you have the shape first before putting these nails in, so you will be able to rub the wood down to the necessary section. Notice the sectional details given on the sheet, showing the shape of this body, and follow out the lines carefully.

The front end is a solid block, and three views of it are given to indicate how it must be shaped. The top of the fuselage, it will be noted, extends



The lower engine and undercarriage for the wheels.



A close-up of the front of fuselage and engines.

get the thing together. Every part must be tested out carefully, temporarily assembled, then taken to pieces until the whole thing is ready to glue up. After the wooden portion of the model has been completed, and the overlays added, the whole model should be painted in the correct colourings as will be given later.

The fuselage is made of a hollow shaped box frame. The main body of the fuselage is two upright sides glued strongly to a floor, with the

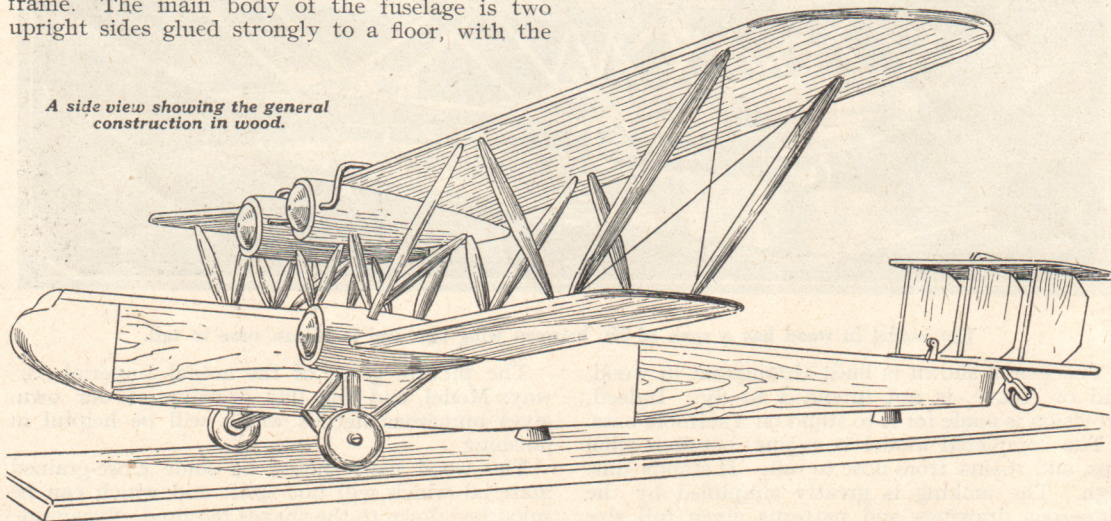
right over this nose piece, and, of course, must be shaped up so the lines run together. The back end of the fuselage has a solid tail, which is also glued under the top.

This tail forms the taper, and here again shaping must be done carefully. The side elevation given on the sheet, shows the angle of the fuselage, and this must be watched carefully as the parts are being built up.

The Wings

The wings can be built as a separate part, and then fixed on to the fuselage, but in doing it, testing must be made all the way through. It will be noted, the wings rise slightly from the centre to the tip, and in consequence, allowance must be made for this in construction.

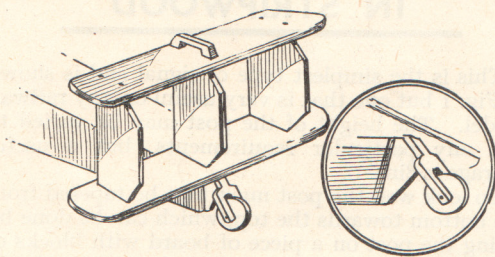
A side view showing the general construction in wood.



Model Air Liner—(continued)

The main portion of the wing, therefore, is fitted on to a centre span, and there spliced. This splicing piece is glued and screwed to the top of the wings, to make a good join, and from there outwards, the wing rises slightly towards its tip, the near edge of it must, therefore, be slightly chamfered.

The lower plane has a slightly different curvature because the centre piece which joins into the gap in the fuselage top, drops a little before the wing itself starts to rise. These small pieces fit into the top, drop slightly towards the engine, and then



A detail of the tail and landing wheel.

have the wing piece fitted outside them. Note that the lower engine fits right into the wing, whereas the upper engines are fixed beneath.

A gap is allowed in the pattern of the lower plane to accommodate this, and the splicing piece provided is screwed and glued at the back edge from one to the other, and not across the wing as in the case of the top.

These splicing pieces provide the tail of the wing, and must be bent to allow this. This bending is done by making a V-groove almost through the thickness of the wood, and then gradually steaming or bending the part so it forms the angle shown by the section on the design sheet.

Get both these splicing pieces true before gluing them. It is a good plan to form a mould or template on the bench for the angle of these wings to ensure they are both the same.

The Wing Struts

The various struts between the upper and lower wings are shown full size on the sheet. The ends are rounded to the circle, whilst the centre portion is made elliptical as shown by the sections. The position of each is clearly shown by the accommodation holes in the wings themselves.

All these struts slope not only upwards but also outwards, and in consequence the holes to be drilled in the wings must be made at the angle of the supports. This angle is shown by a dotted line near each hole to be drilled. This dotted line indicates where the brace comes out on the opposite side of the wood.

Two of them, it will be noted, fit into the engine on each wing, whilst the two innermost ones are glued into the top of the fuselage itself.

The engine which is fitted under the top wing is also the holder of the top end of five of the struts, and one must be careful to test these out ready to fit in place.

The shaped engine piece cut from solid wood to the shape shown, is glued in place next, and must be fixed, of course, before the struts are put between the upper and lower planes. The lower engines fit into the space allowed in the bottom wing, but the two top ones fit beneath and are fixed just inside the join of the wing span and the centre piece.

The top of these two upper engines must also be slightly flattened, to allow them to bed nicely on to the plane itself. The front of each engine, of course, has to be fitted with a four-bladed propeller. Each of these is cut from a piece of 3/16in. wood 2 3/8ins. square.

The pattern shown, is pasted down so the grain runs across each prop in an oblique manner. This provides the greatest strength for shaping.

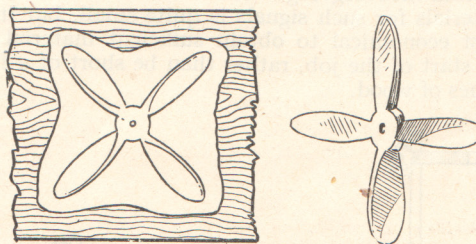
When they are finished, bore a hole through the centre and fix with a round headed screw on to the boss formed by a little round button which has been glued to the end of the engine.

The Exhausts

The wire forming the exhaust is 1/8in. diameter brass, and one end is forced into the side of the engine just behind the front. It is carried along, bent at right-angles to come up to the front edge of the wing, and then carried over the wing itself for a distance of 1 1/2ins. The undercarriage is formed of shaped wheels, held in place by three shaped struts.

These struts fit to each other and into the fuselage, and lower engine, the details given, showing them clearly. The wheels are shaped up from 1/2in. wood and an axle provided through the centre hole. To the outside end of this axle a short mudguard is fitted by means of a piece of wire.

At the rear end of the fuselage we have the tail

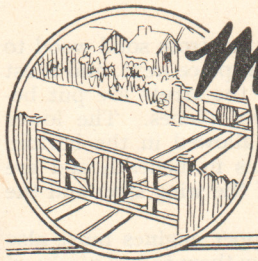


The pattern and finished shape of a "prop."

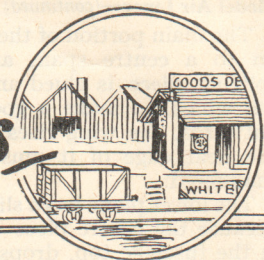
plane, fin, elevator and rudder, all of which can be seen in the detail given. The rudder and elevators should, of course, be separate parts, and this can be done if thought fit, to make it more realistic. There is no real need, however, and the join can be just marked on later when the model is painted.

The tail wheel is cut from 1/2in. wood fixed into a little bracket, and then glued at the extreme end of the tail, supported there by a triangular piece. Various thin overlays are added to form the door openings, window spaces, generator, safety slots, etc., and these are quite easily cut and glued in the positions indicated on the respective patterns, or shown in the various details.

(To be Continued)



Model Railway Accessories



PRACTICAL signals for a small railway can be made with Stripwood. The signal arms will naturally appear a little on the heavy side but this is not a serious matter when the saving in cost as compared with the commercial article, is taken into account.

Materials Required

The posts or uprights should be made from stripwood, $\frac{3}{4}$ ins. square, a single 24in. length will be sufficient for 3 or 4 single arm signals, 2 bracket signals," or 1in. gantry.

For the arms or "semaphores" use $\frac{1}{4}$ in. \times $\frac{3}{4}$ in. stripwood, and reckon 11 arms to one 24in. length.

A length of $\frac{5}{16}$ in. or $\frac{3}{8}$ in. dowel rod will be needed for the dummy signal lamps.

The bases can be made with $\frac{1}{4}$ in. \times 1in. stripwood, reckoning 22 bases to the 24in. length of wood.

For the "spectacles" a small piece of 3-ply wood about $\frac{1}{16}$ in. thick will be needed; a piece about 3ins. by 6ins. will be enough for a couple of dozen.

When making bracket or gantry signals some $\frac{1}{4}$ in. by $\frac{1}{4}$ in. stripwood will be required, allow about 24ins. for one gantry or four bracket signals.

Making a Single Arm Signal

From the foregoing it will be seen that the cost of materials for such signals is quite small, but it is most economical to obtain sufficient material at the start of the job, rather than be short of a few inches of wood.

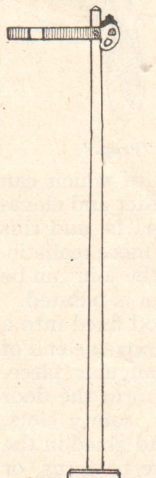


Fig. 1—A single arm signal.

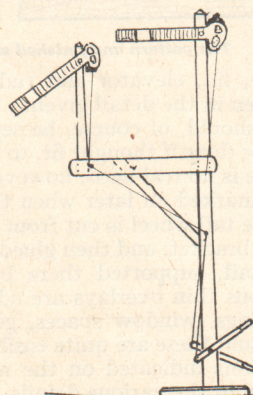


Fig. 7—A bracket signal.

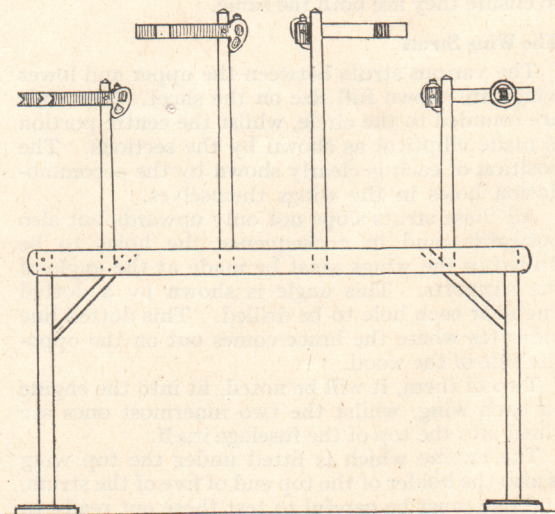


Fig. 8—This type is called the gantry signal.

GAUGE 0 SIGNALS IN STRIPWOOD

This is the simplest type of signal and is shown in Fig. 1 but one that is very useful on any railway model. The height of the post may be varied to suit any particular requirements, but a useful average is 8ins.

To look well the post must first be tapered from the bottom towards the top, which can be done by laying the post on a piece of board with blocks of thin wood nailed to it, so that the post is firmly held while planing.

The Base

Next prepare the base, Fig. 2, by cutting a piece of $\frac{1}{4} \times 1$ in. stripwood to a length of 1in., thus forming a square.

Cut a hole $\frac{3}{8}$ in. square in the centre which is best done with a fretsaw.

Bevel or round off the edges and then glue the post into the square hole, taking care that it is upright.

Weighted Bases

The base itself can be fixed to the railway table with glue or a fine screw; but if the signals are to be portable, the bases should be weighted with sheet lead nailed to the under side.

Gauge 0 Signal.—(continued)

The next thing is to make the arm, Fig. 3, which is simply a plain length of stripwood 2ins. long. For a distance of $\frac{3}{8}$ in. from one end, chisel or file away the wood until it is half its thickness, then cut out the spectacle—as shown in Fig. 4, and glue it to the recessed part of the arm.

When dry, drill a small hole through the arm and put a $\frac{3}{8}$ in. No. 0 round headed screw through it, see that the arm moves freely on the screw, then drive the screw into the post but do not pinch the arm, leave sufficient slack to allow the arm to move easily up and down.

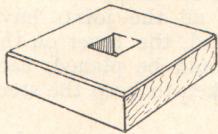


Fig. 2—The Base.

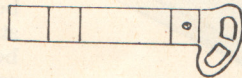


Fig. 3—The complete signal arm.

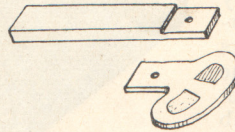


Fig. 4—An arm and spectacle.

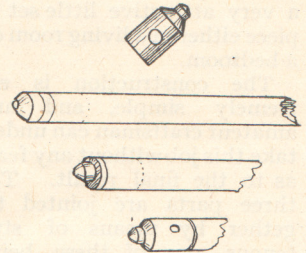


Fig. 5—The stages in lamp making.

The dummy lamps are made by shaping the end of a piece of dowel rod with a chisel or a pocket knife as shown in progressive stages, in Fig. 5—to represent the lamp top. Cut the dowel rod to length after shaping the top, then clean up the underside and glue it to the post so that the lamp comes in line with the spectacle when the arm is horizontal.

Working the Signals

Signals made in this way will always "fall" under their own weight provided the screw is not too tight, consequently they can be worked from a distance by means of threads and a simple lever, the whole scheme being clearly shown in Fig. 6, the thread being fastened in a small hole in the spectacle and guided by means of small screw eyes to the lever which is simply a piece of $\frac{3}{8}$ in. by $\frac{1}{2}$ in. stripwood 2 $\frac{1}{2}$ ins. long pivoted to a very short post, but in this case the screw is tightened sufficiently to hold the lever in any position.

A fretwork nail should be driven into the signal post to prevent the arm

raising too much, and a second pin used as a stop to check the fall. In the "on" or danger position the arm should be horizontal, in the "off" or "all clear" position it should be inclined at 45 degrees.

If preferred, the lever can be fixed to the bottom

part of the signal post and be connected by a thread to the signal arm.

Making a Bracket Signal

This type of signal is shown in Fig. 7 and is made in the same manner as a single signal with the exception of the bracket, which consists of two pieces of stripwood glued and pinned to the posts and strengthened by a diagonal piece.

A gantry signal is made on the same lines, as shown in Fig. 8, but there are two uprights—one at each side and shorter signal posts fastened to the gantry.

The "fishtail" or V shaped signal arms are made as before but the notch is cut in the end as shown, also the "goods" or siding arms can be made a little shorter—say 1 $\frac{1}{2}$ ins. and have a disc on them about $\frac{3}{8}$ ins. diam.

Colouring

The correct colours are, posts white with black bases and levers. Lamps, black; arms "signal" red with white band on face side, and white with black band on reverse side. The spectacles are red, with a red painted "light" at top part and green below.

The twopenny tins of Crusoe enamel obtainable from Hobbies are quite suitable, being easily applied in bright strong colours.

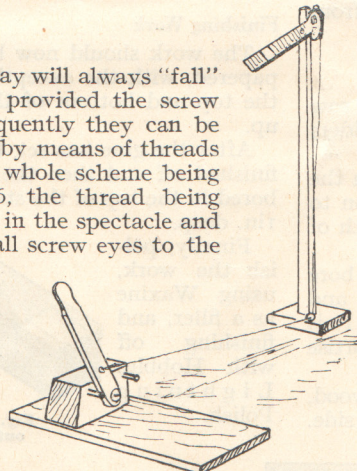


Fig. 6—Working a signal from a distance.

A Photographic Annual

IF the past year has seen no startling developments in apparatus and materials, it has, at least, seen steady progress in perfecting, and fresh achievements in the adaptability of existing apparatus and in improving materials.

Records of these and all similar advances will be found recorded in the "British Journal Photographic Almanac," which has just

been published for the 76th time. It is a remarkable epitome of photographic practice: the busy professional and the serious amateur can equally learn from its 748 pages all the improvements that are available for their work in the coming year. In addition, they will find a reliable series of standard and well-tried formulae, and a number of interesting and useful

articles on various types of photographic and cine work. It is an exceptionally valuable work of reference, and, in addition to the text, it contains 64 pages of photographic reproductions of pictorial and commercial photographs.

This standard work is published by Henry Greenwood and Co. Ltd., 24, Wellington Street, London, W.C.2. The price is 2/.

ATTRACTIVE

CANDLESTICKS

IF a couple of dwarf oak candlesticks are made to go with the clockcases, previously described, they will complete a very attractive little set for a mantel-piece either in a living room or a bedroom.

The construction is extremely simple, and any amateur craftsman can undertake this job without any fears as to the final result. The three parts are jointed together by means of stub tenons, one of these being cut on each end of the stem.

First of all the wood should be planed up and then a tenon marked out on each end of the stem. Fig. 1 shows a tenon marked out ready for sawing and also the finished joint.

The length of the tenon should be made about $\frac{1}{2}$ in. longer than the thickness of the wood it is going into, to allow for cleaning up afterwards, and this line should be squared right round the stem. The thickness of the tenon should be gauged from both the face side and face edge of the wood.

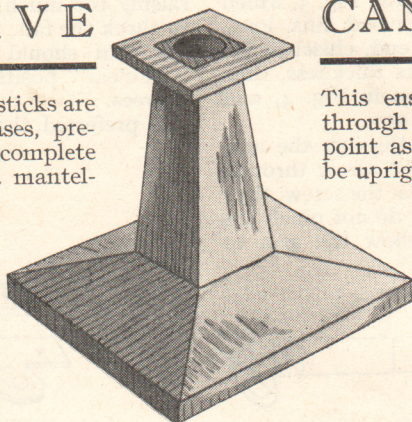
Hints on Joints

When sawing out the tenon, make all the saw cuts with the grain first and saw the shoulders last.

Next mark out the length of the mortise on the base; this should be carefully squared over on to the other side of the wood and then the width of the mortise gauged on both sides.

The best way to cut out the mortise is to bore the largest possible hole through the centre and then chisel out the remaining waste wood. It is advisable to chisel the end grain of the mortise first and the sides afterwards.

Complete the mortise on one side of the wood, then turn it over, and finish it from the other side.



This ensures the mortise being square through the wood which is an important point as, otherwise, the stem would not be upright.

The tenon on the top of the stem and the mortise in the top of the candlestick, are made in exactly the same way as those in the base.

When all the joints have been fitted, the taper on the stem should be planed, care being taken to keep the stem square.

Next mark out the chamfers on the base and top and plane these in turn. It should be remembered here that, in the case of a severe design such as this, the appearance depends solely upon the way the stem is tapered and the other two pieces chamfered. All the surfaces must be finished quite flat and the corners of the chamfers should be a continuation of the edges of the stem.

Finishing Work

The work should now be cleaned up and glass-papered, with the exception of the top surface of the top and bottom of the base, and then glued up.

After the glue has set, these two surfaces can be finished off and then the hole to take the candle bored in the top of the stem; this should be about $\frac{1}{2}$ in. deep.

Finally, polish the work, using Waxine as a filler, and finishing off with Hobbies Lightning Polish.

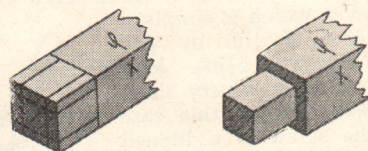
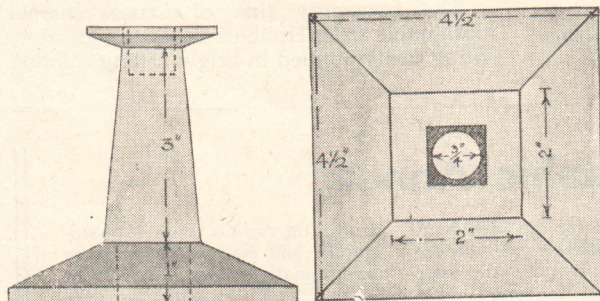
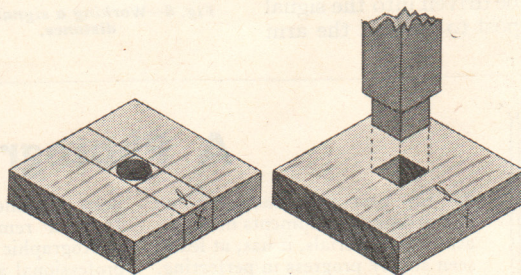


Fig. 1—The tenon marked out and the finished job.



A side-view and plan giving principal dimensions.



How to mark out and cut the base.

A Toy Train Model Free Next Week !

What's going on

A popular Science Feature

Water Worth a Fortune !

CLOSELY guarded in the laboratory of a Californian university is a small phial of liquid worth nearly £30,000 !

It looks exactly like water. In fact, that's just what it is—with a difference. Ordinary water, as we all know, is composed of two parts of hydrogen to one of oxygen. Some hydrogen atoms, however, (about one in every five thousand), are twice the normal weight and scientists have recently discovered that an entirely different substance is produced when these combine with oxygen. "Heavy water," they call it; tasteless, odourless, and a deadly poison.

"Heavy water" has quite amazing possibilities. Experts believe that it may form the basis of innumerable new chemicals, it could probably be turned to good use in the dyeing industry, and its destructive properties would be invaluable for combating insect pests and bacteria. But unfortunately only a minute quantity is available at the moment; something like a pint in all. So chemists in every part of the world are working feverishly to unearth a short cut to production on a large scale.

Dr. A. J. Eneleus, of the Royal College of Science, knows more about "heavy water" than anyone else in this country. His laboratory is an astonishing place full of special machinery and no end of unbreakable glass. Even so, countless complicated processes of evaporation and distillation only result in about half a cubic centimetre of the precious fluid per day.

No doubt you have noticed that nothing ever grows under weeping-willow trees. Well, *perhaps* it's because they weep "tears" of "heavy water" !

Something Hot in Wall-papers !

THAT jolly fire in the sitting-room may soon be a thing of the past ; all the warmth necessary will come from the paper on the walls instead.

At least, that is the idea of a London scientist who has evolved this novel means of preventing the radiation of heat from our bodies

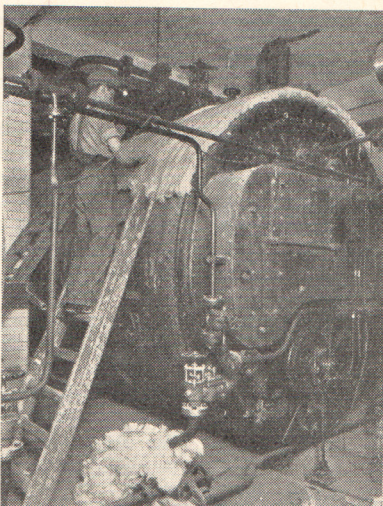
to cold walls (which, of course, makes us feel chilly).

His special wallpaper contains a system of fine mesh copper-nickel netting. And when this is connected to an electric circuit sufficient resistance is set up to raise the temperature of a room as high as 85 deg. Fahrenheit !

Death-Watch House

JUST outside Prince's Risborough in Bucks is England's most curious house ; where a little group of men wage war on the destructive Death-watch beetle.

Every year the Death-watch does enormous damage to the woodwork of ancient buildings.



(By courtesy Chance Bros. & Co. Ltd.)

An "eiderdown" of silk on a boiler.

So a great offensive has been launched by the Forest Products Research Board ; those brainy fellows whose job it is to investigate all kinds of timber problems. From the comparative strength of pit-props to the effect of wood-smoke upon fish.

Old timber was specially built into the roof of this house so that observations might be carried out under more or less natural conditions. They have got, too, a super radio set that makes it possible to hear the insects scuffling about inside the beams. And downstairs—in the "General Headquarters," so to speak—you will find a large map of Great

Britain bestudded with black pins. Each one marks an affected area.

Initial experiments have centred around the problem of the beetle's food supply. How in the world does it derive nourishment from such an unpromising material as wood ? A number of yeast-like micro-organisms situated near the digestive organs may have something to do with it. But that remains to be seen.

Another experiment thoroughly exploded the theory that buildings are safe from attack if a lot of incense is used in them. Some larvae were exposed to concentrated incense fumes for a fortnight and afterwards appeared to be little the worse. They rather thrived on it, if anything.

Fares Please !

BUS conductors will have a soft time if (as seems likely) a new Swedish machine is introduced over here. It automatically hands out a ticket and the exact change for any coin put in the slot.

The Engineer's Eiderdown

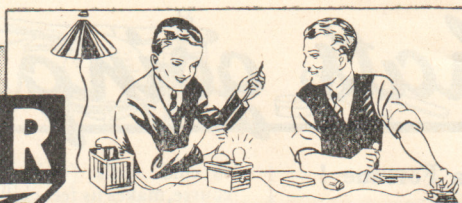
RECENTLY we handled what appeared to be an immense hank of silk. Actually it was glass-silk ; the last word for heat and sound insulation.

The commercial form consists of countless layers of "spun" glass imposed one upon the other ; glass "spun" so fine, indeed, as to be no longer fragile. You can even fold or crumple it. So effective is this material that it has been used to prevent heat wastage from boilers in hotels, schools, liners, power stations and so on, allover the world. Moreover, vibration does not affect it. Nor will it corrode. And rats cannot eat it.

At Chance Brothers' Glasgow factory they first melt the glass in enormously powerful electric furnaces. Then, as it comes oozing through a small hole, girl operators armed with glass rods whisk bits off on to a rapidly revolving drum alongside. The drum does the rest ; drawing the molten stuff out into those incredibly delicate threads.

The AMATEUR

ELECTRICIAN



A NUMBER of papers give instructions from time to time on making models. Some of these are dependent on extremely fine work, often only attainable by skilled use of a lathe, for them to act well. Nothing is more discouraging than for a beginner to spend time and money on something which is not satisfactory.

Four model motors were made, each one being a bit simpler than the last, but each time the lathe had to be used, so in the end the writer turned (no pun!) to construction from easily obtained parts that are true, or turned to start with.

As you will see, the motor is made with a set of Tricy-Trix and a set of No. 2A. Three extra coils or bobbins are needed, and these are obtainable separately at sixpence each.

The aim of the present model is to teach the effects of different windings and connections used in motor construction. Of course, in practice, the windings vary a great deal for the different types,

AN EXPERIMENTAL ELECTRIC MOTOR

so it will be apparent that this model with its one size of wire, is not particularly efficient. It does work, how-

this, bearing up against a small length of tube at the front end. An extra hole must be drilled in the two large discs because they have 16 holes in each outer circle. This number, of course, will not divide by three, and the extra hole is needed to put the armature in mechanical balance. We decided on three poles as being simplest while self starting,

which a two-pole is not.

The commutator which usually presents the most trouble in making, has been made very easy.

Place a cotton bobbin on a flat surface, and beside it

lay a tin, or a piece of board, about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick.

Hold a chisel or knife flat on the block, and turn the bobbin so the chisel scores a mark all round. Then cut the bobbin in two on this line.

Now screw a copper or brass washer to the cut end on which there must be six screws, located as in Fig. 3. Then cut the washer into three equal segments, using a fine metal saw, cutting from the middle outwards, at a slight angle, so as not to cut the opposite segment. This will cause you to cut a little way into the bobbin, but it will not matter, providing the particles of metal are cleared out of the saw-cuts.

Fasten the commutator to the armature by screws from the front side of the back plate, taking care to miss the screws already in the bobbin from the other side. The hole in the bobbin only can be enlarged to reduce the friction on the stationary shaft.

There is one brush in the Tricy kit, and you can obtain another, or using the one as pattern, make another like it from the brass strip.

To make the brush gear,

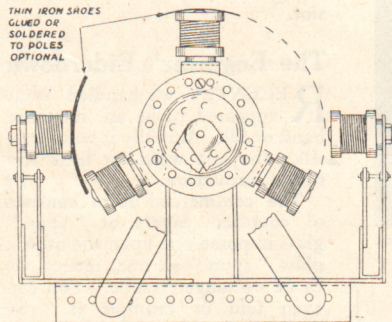


Fig. 1—The general layout of the motor.

ever, with each one of the wiring systems given.

The general construction is shown in Figs. 1 and 2 and in some instances, for the sake of clearness, bolts and nuts are not shown when it is quite obvious where they should be.

Working on 4 volts, these coils have such a strong pull that it is essential to have the field magnet supports very rigid. A slight gain in efficiency will be obtained if you care to fix a small iron disc or washer on the face of each coil; i.e. on the end opposite to the nut end.

The spindle is fixed, and the armature rotates on

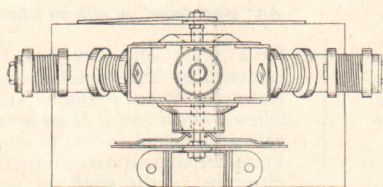


Fig. 2—Another view of the motor.

bolt the two insulating strips to another circular plate with four bolts, and then bolt the brushes to the insulators. An extra nut on

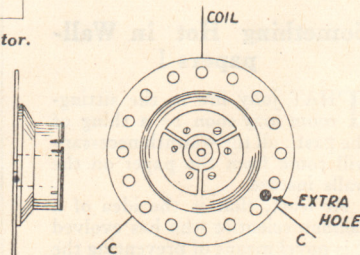


Fig. 3—How to make the commutator.

An Experimental Electric Motor—(continued)

each of these bolts forms the terminals for the connections.

You can use a wireless filament resistance of 10 to 15 ohms, or make one very easily as in Fig. 4.

To reverse the direction in which the armature turns, you must reverse the wires to the armature. This can be done at will, if you include a double-pole, double-throw switch as in Fig. 5.

We have shown this made with plugs and sockets but your own ingenuity and the material available will guide you in this.

The Permanent Mag. Motor

There is another type of motor, the permanent magnet one, but only practicable in small sizes.

When you have made the armature and commutator and mounted it on the spindle, you can place a magnet from a magneto horizontally in front, to take the place of the field coils. Connect the brushes to the battery and the motor will run. If the magnet is too small to span the rotor, bend two strips of iron to suit, and tie one to each magnet leg.

If you use the water resistance, notice that bubbles rise from both plates, but that one gives off a great deal more than the other. This will show you the polarity, not that you need to worry about polarity with small motors, except as a matter of interest.

Most bubbles are from the Negative wire.

Notes on Wiring

The armature coils can be connected in two ways, but in either case, each coil must have the beginning of the winding, that is, the wire nearest the middle, soldered to the commutator segment nearest to it.

The end of each coil can be joined to the beginning of the next one as in Fig. 6, or each of the three

end wires can be joined together as in Fig. 7. There does not seem to be much difference in performance either way.

There are three main types of direct current motors, classified according to the method of connecting the field and armature coils, each type having its own sphere of usefulness. We have only space to deal very briefly with the main points of difference, but you can learn the fundamentals from our model, and with the interest gained we hope that you will get a text-book on this fascinating subject, and soon will be designing your own motors.

Types of Winding

The three types are: shunt wound, series, and a combination of these two known as Compound wound.

Compound motors are outside the scope of this simple model and short article.

If the armature is joined in parallel with the field, that is, shunted across, as in Fig. 8, both the field and armature form a complete circuit, and each is in direct connection with the battery.

In the large shunt motors, the resistance of the armature is relatively small, so if the full current were applied on starting, the armature probably would be burnt out. Therefore a variable resistance is included in the armature circuit, and this resistance slowly decreased as the speed increases. Now you know that when a coil of wire cuts a magnetic field, an electric current is generated, so you see that when a motor armature is spinning, it is also generating current. This current opposes the current which is driving the motor, and when the speed is built up, the resistance is not needed.

The Result

The result is that the current flowing in the armature is determined by the applied voltage and

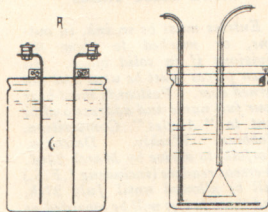


Fig. 4—A resistance filament.

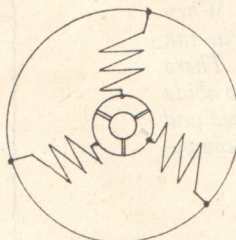


Fig. 7—Joined with a single wire.



Fig. 6—Coils joined to each other.

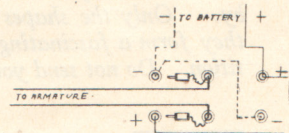


Fig. 5—Circuit for switch as explained.

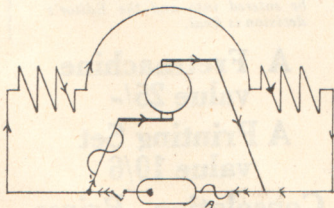


Fig. 8—Altering the variable resistance.

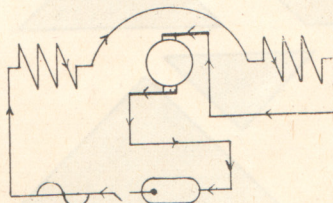


Fig. 9—Connections for a motor in series.

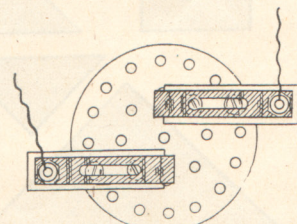


Fig. 10—Fixing brush carriers

An Experimental Electric Motor—(continued)

the generated current (known as Back E.M.F.-Electric Motive Force) resisting it, and the current drawn from the supply is only that required to overcome the winding resistance, the friction, and the magnetic losses.

A Shunt motor runs at practically constant speed:—if the load is increased, it draws more current from the supply.

If you want to vary the speed, try the effect of altering the variable resistance in the armature circuit, as shown by the "S" shaped line in Fig. 8. Then notice the effect of putting the resistance in both armature and field as at "a"

In Series

In the Series motor (Fig. 9) the current does not divide to the two separate circuits of armature and field, but continues from one to the other. In this case also, a resistance should be used when starting.

A Series motor has a large starting torque ("torque" means turning movement) but if run on no load without extra resistance, the speed would increase beyond safety.

The main switch must cut out both field and armature so that it is in one of the wires between the battery and the motor. In many power motors, both the supply wires are disconnected by the switch.

The two brushes are exactly opposite to each other and, when in position, should be so that a line through the two points touching the commutator will be at right angles to the field magnets. As the brush carrier is held by one of the spindle locking nuts, the position of the brushes can be varied (the best position is soon found by trial), if this nut is slackened.

Mount in Line

Fig. 10 shows the approximate position, but in Fig. 2 the brushes are turned out of the correct position to show the construction.

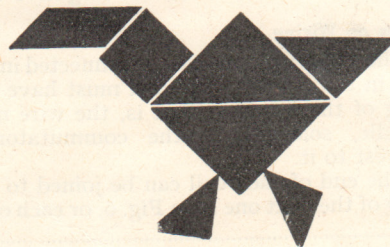
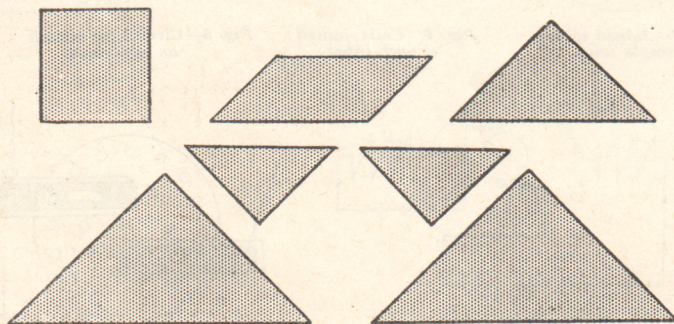
When mounting the armature coils, see that each is in line with a commutator segment, that is, mid-way between the saw-cuts.

Do not forget a little oil on the moving parts; for small motors, glycerine is best.

A NEW COMPETITION

No Entrance Fee. 20 Prizes !

HERE is a little competition which will try your skill and keep you amused, and may win you a prize. From the shapes shown below actually hundreds of quaint figures and forms can be made. It is fascinating and enjoyable too. See what you can do. Trace or paste the designs to a piece of $\frac{3}{16}$ in. or $\frac{1}{4}$ in. wood, cut out carefully with a fret-saw, and then see what shapes you can make. When you have got a real good one draw the outline in ink on a postcard and send it in as an entry. There is no entrance fee and only a very few rules to abide by. Only the shapes shown below can be used and they form a fascinating game even after the competition. Do not send your cut pieces.



Read these Rules

Entries must be in ink, in outline, or marked to show the divisions if in solid black. All seven pieces must be used and not turned over. Postcards must bear your full name and address and be sent to "Angles" Competition, Hobbies Weekly, Dereham, Norfolk, to arrive by March 23rd. Overseas readers (including I.F.S.) will be allowed until July 27th, and three prizes will be awarded as goods value, £1, 10/- and 7/6. The prizes will be for most original, quaint and realistic outlines. No correspondence can be entered into and the Editor's decision is final.

**A Fretmachine
value 25/-**

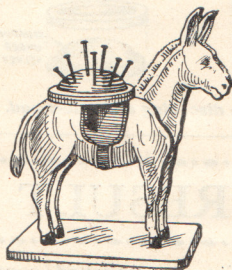
**A Printing Set
value 10/6**

**Consolation Prizes
of Splendid Books**

A BRUSH HOLDER And Pincushion Novelty

WE are giving our readers two more little novelties this week to make up with the fretsaw and odd wood and no doubt these again will be popular for selling at bazaars, sales of work, etc. Clothes brushes are always useful things to have, and by having a rack to hold a pair they are, or should be, always ready at hand when wanted.

The little Dutch girl and boy which go to make the front of the rack, when coloured up nicely, certainly strike an artistic note and by being cut round with the fretsaw, give a very realistic appearance.



The Pincushion.

as that sold by Hobbies for 1/3) would be found most useful when drawing out these simple parts on the wood. Use a medium fretsaw blade when cutting round each part and clean up the edges afterwards with fine glasspaper.

The Holder

At Fig. 2 is shown how the two sides are cut from the one piece of stuff measuring $8\frac{1}{2}$ ins. long by 2 ins. wide. Glue the sides to the back with edges flush, and then cut out the base 5 ins. by 3 ins. and glue this on allowing a narrow margin

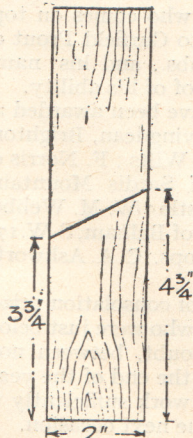


Fig. 2—Two sides front one piece.

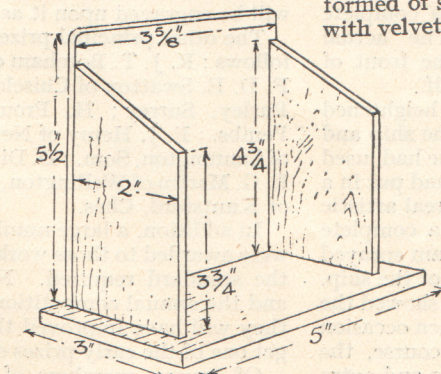


Fig. 1—The actual holder parts.

along the back edge.

The piece of plywood required for the front measures $5\frac{1}{2}$ ins. by 5 ins. wide and over it must be drawn a series of $\frac{1}{2}$ in. squares as shown in Fig. 3. Draw in the two figures carefully, following each square so as to get the enlargement a correct copy of the smaller one.

Put in all the interior lines and shapes, and then make a tracing on some thin paper to serve as a guide, when the general colouring up with paint is being done.

Colouring

The cut edges of the wood may either be painted black all round or they may be coloured to suit the surface colouring, that is, each front colour should follow round on to the thickness of the wood. This latter, perhaps, gives the most pleasing effect.

When the front is finished it must be glued to the sides and to the base, one or two little blocks of wood being glued into the angles at the rear to add to the strength.

This rack is made to hold a pair of brushes as sold by Hobbies at 2/9, the number 6121 should be quoted when ordering.

The Pincushion Holder

Our second little article consists of a pincushion in the form of a pack donkey, the load being a pad formed of sawdust or other suitable filling covered with velvet.

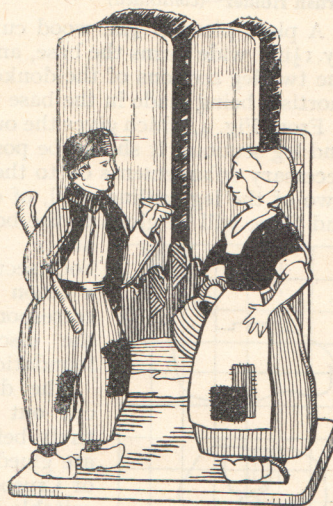


Fig. 3—An outline of the figures.

Brush Holder—(continued)

A plain piece of $\frac{1}{4}$ in. wood cut about 3 ins. long by $1\frac{1}{2}$ ins. wide forms the base, and to this are fixed the two leg sections of the donkey; small holes or mortises being made in the base to take these.

From Fig. 4, which gives the outlines of the body and leg sections, it should be possible to make the necessary enlargements on to the $\frac{3}{16}$ in. plywood. Two of the leg outlines will, of course, be wanted and these will be glued to the body section shown

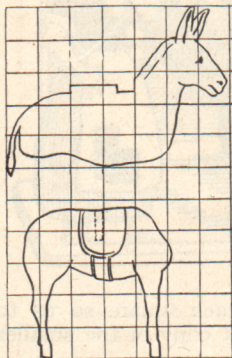


Fig. 4—The shape of the donkey.

above. On the top of this body section will be noticed a tenon which fits into a corresponding mortise in the disc and forms the foundation of the pin pad.

The donkey should be cut out and finished entirely before the top discs are glued on. Poster paint or Crusoe enamel is highly suitable for the colouring up.

At Fig. 5 is shown the plain disc and the ring of $\frac{1}{4}$ in. plywood which go to form the pad, and also

the little strengthening blocks or brackets which are glued on underneath. In making the pad, the plain disc is first of all glued to its tenon and the brackets put on underneath. A mound of fine sawdust or perhaps a few coils of wadding or horse-hair is then laid on and carefully covered with a piece of velvet cut circular to the size of the disc.

The edges of the velvet should be just tipped with glue so when the ring of wood is placed over it is held down tightly. Do not brush too much glue on the underside of the ring which again should be held down by four small round-headed screws.

The edges of the disc and the ring should be finally painted up to match the other work. For the benefit of those workers who perhaps are not quite expert enough to do their own enlarging from the squared diagrams given, the Editor will send them full size outlines of each.

Those requiring the outlines should send a stamped, addressed envelope, with their request and 3d. in stamps to the Editor, Hobbies Weekly, Dereham, Norfolk.



Fig. 5—The disc, ring and velvet pad.

GIFT DESIGN COMPETITION RESULT

AS usual, there was a large number of entries in the Open Section of the Gift Design Competition which closed at the end of January. So large indeed, that the judges took considerable time before they could decide which actually were deserving of the premier awards.

The piece to be cut was a shaped mirror frame, and some really very striking effects were obtained. There was not a single badly-cut piece of work and everyone is to be congratulated on the standard of cutting attained.

Some gained considerably more points by the introduction of novel finishes or additional work. One of the most outstanding in this work was a brilliant piece submitted by a lady. She had cut a background exactly the same shape as the outline of the entry, and had fitted on to it a complete small cabinet with three drawers. The actual competition piece was then fitted to the front of this as a hinged door to the cabinet itself.

There were also many workers who heightened the beauty of their work by painting the ship and the features of the scene in colours. Some had used plain bright colours of enamel. Others had put in a water colour, and a few had shown real artistic merit by painting the whole thing up as a complete picture, with the billowing sails, and foam sprayed waves and the high peak and bulwarks of the ship.

All of which was very interesting and showed the ingenuity which workers can display when occasion arises. In the competition itself, of course, the prizes were awarded for the best cutting and extra points were only given after this virtue had been

decided. Again, some entries were polished, some were left in plain wood.

As we said in our instructions for making up the work, it was better to leave a well cut piece in outline, than to spoil by a bad finish in stain and glaze.

The use of Lightning Polish, however, has become so general that there was not a single instance of a badly polished piece of work, and workers are gradually realizing what added beauty can be provided by the addition of a little time spent with the polishing rubber.

The premier award in the competition, of course, carries with it the £10 cup, which is held for twelve months by the worker who comes on top. This year it is being awarded to Garfield Prout of Sardis, Nr. Saundersfoot, Pembs., and his name will be engraved upon it as proof of his ability.

The other principal prizes have been awarded as follows: R. J. T. Boreham of Ovingdean, Brighton; F. D. E. Swatton of Chiseldon, Wilts; F. Norris of Purley, Surrey; H. Prout of Sardis Mountain, Pembs.; F. J. Hemy of Newcastle; W. M. Webber of Cannington, Som.; D. Dixon of Balham, S.W.17; E. G. Martin of Wellington, Shrops.; C. A. Ashworth of Knutsford, Ches.

In addition, a large number of consolation prizes were awarded to those workers who were just below the standard required. No doubt, between now and the annual competition at the end of the year, they will have improved their work sufficiently to get one of the early prizes on the next occasion.

Of course, members of the League who were prize winners, received a further prize.



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Yours faithfully,
GEORGE MOFFATT

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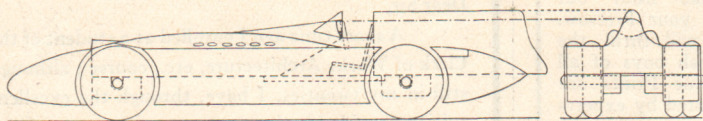
Dept. 62, THE BENNETT COLLEGE, SHEFFIELD

WOODEN MODEL OF

WORLD-WIDE interest has been maintained in the record-breaking attempt of Sir Malcolm Campbell in his rebuilt "Blue Bird" at Daytona Beach, and readers will be keen to make up the little wooden model from the patterns given below.

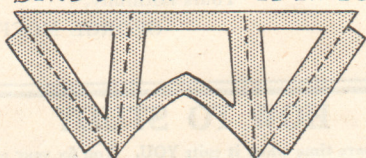
It is quite simple, being built from solid pieces of wood which are shaped down to form the streamline effect shown in the detail below. The constructional drawing on the right shows the parts as they are gradually assembled. All the final work of shaping must, of course, be done with a file and glasspaper. The wheels are supplied ready turned, and are glued to axles which run in bearings on the underside.

The body of the car is two $\frac{5}{8}$ in. pieces, and the outer shaping provided by two

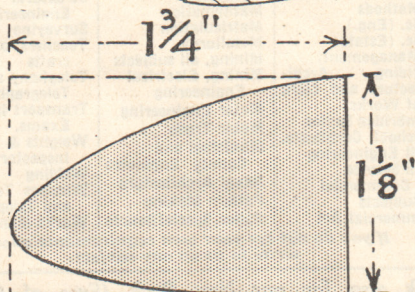
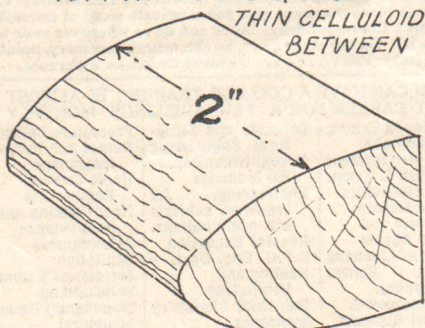


A side and front elevation showing position of the parts.

BEND ON THE DOTTED LINES

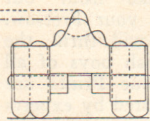


WIND SCREEN, CUT TWO FROM THIN CARD & GLUE THIN CELLULOID BETWEEN



BLOCK FROM WHICH THE NOSE IS SHAPED.

FILLING-IN PIECES, CUT FROM $\frac{3}{8}$ IN.



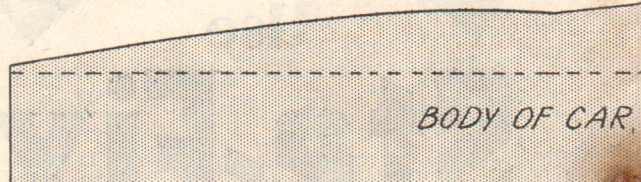
SEAT SUPPORT

FLOOR, CUT ONE $\frac{1}{8}$ IN.

SEAT SUPPORT



CUT FROM GLASSPAPER DO



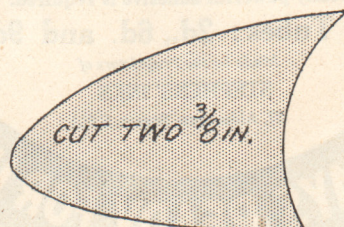
BODY OF CAR



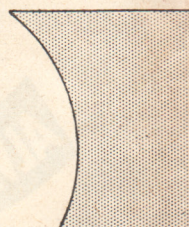
CUT BLOCK $\frac{3}{8}$ IN WOOD & GLUE ON THE BODY



AXLE



CUT TWO $\frac{3}{8}$ IN.

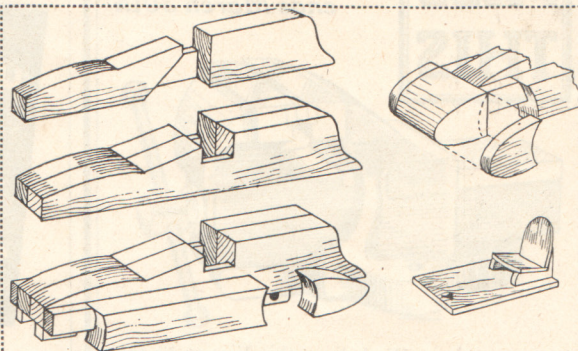


F THE "BLUE BIRD"

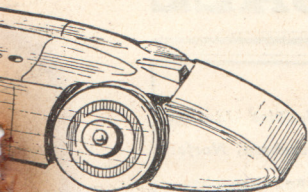
$\frac{3}{4}$ in. sides. The axle bearings are cut from $\frac{3}{8}$ in. wood, and glued under the body flush with its edge, and central between the opening of the sides. The position of one is seen in the constructional drawing.

Shape all the parts before gluing. Glue the wheels to their axles so that both of them revolve together. The wind screen consists of two pieces of fairly stiff card between which a piece of cellophane wrapping from a chocolate or cigarette box is glued. Cut to the outline of the pattern, and then bend down the gluing flaps to the dotted lines.

The whole model, of course, is painted blue, with small cross flags of England and America on the front, and the Union Jack very small in the top corner of the tail upright fin.



The various stages in the construction of the model.



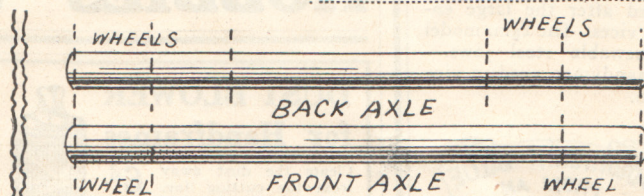
BACK SEAT

$\frac{1}{8}$ in. & DOWN.

CUT TWO $\frac{5}{8}$ in.

SEAT SUPPORTS CUT FROM $\frac{3}{8}$ in.

OUTER SIDES, CUT TWO $\frac{3}{4}$ in.



SECTION STEERING WHEEL $\frac{1}{8}$ in.

ENGINE CASING ON TOP OF BODY, SHAPE TWO PIECES AS SHOWN IN SECTION & GLUE ON.

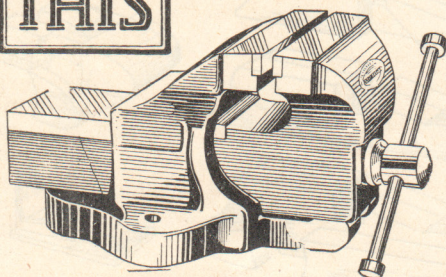
SEAT SUPPORTS CUT TWO

$\frac{1}{8}$ in. THICK.

CUT TWO $\frac{3}{4}$ in.

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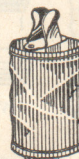
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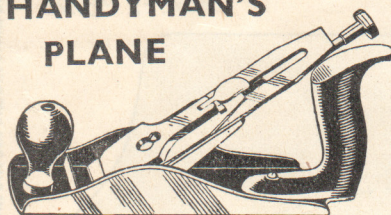
Clears the dust away from the cutting line. Clips to top arm of frame.

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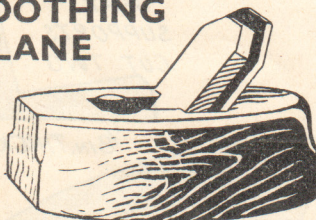
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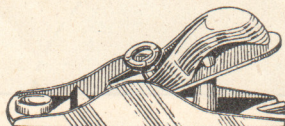
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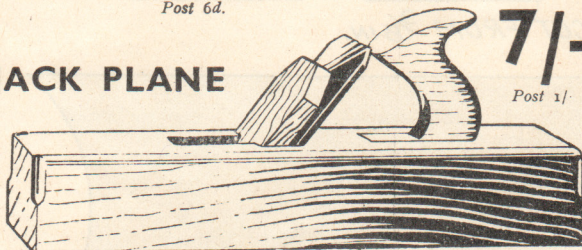


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SIMPLE METHODS TO PREVENT WOOD WARPING

WITH the increasing difficulty in obtaining timber really well seasoned, there is a correspondingly greater tendency for boards to warp and twist after assembly. In the following notes and illustrations, various methods are described and illustrated, which are practical and can be used to prevent warping.

Adding Battens

The most elementary method is shown in Fig. 1. Battens or cleats are fixed to the underside of boards by nailing through from the face side. The nails should be of such length, that they will project a $\frac{1}{4}$ in. or so through the battens. They are secured by "clinchng," that is turning them over,

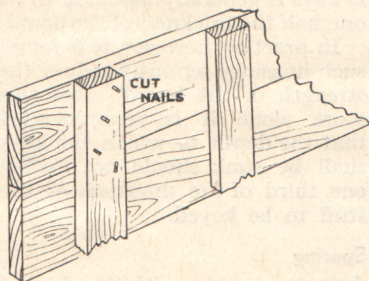


Fig. 1—Strengthening battens nailed on.

taking care to turn the ends in the direction of the grain upon the cleats.

It is usual to punch the nails below the surface on the face side before "clinchng," and then later to punch the turned ends beneath the surface of the cleats, but unless the nails are turned correctly in the direction of the grain, this can hardly be accomplished. The nail holes should be stopped in with putty. Cut nails are the most suitable to use, placing five nails in each outer board, with three in the inner. These nails should be staggered, as shown.

A Mortise Method

In Fig. 2 we have a method similar to the foregoing except that screws are used in place of nails. The procedure is to bore the holes for the screws first, making the hole of such size that there is clearance for the shank of the screw. Stout screws are used, actually it is only the head of the screw which secures the cleat. The screw

holes need to be counter-sunk, and positioned as shown for the nails in Fig. 1.

A superior method of securing the cleats by screwing is shown in Fig. 3. In order that the board or boards can expand or contract freely, narrow mortises an $\frac{1}{8}$ th in. or so wide are cut and extend up to $\frac{1}{2}$ in. on either side of the screw holes in the direction of the grain. Actually the width of the mortises is governed by the size of the screws to be used. There should be sufficient room in the mortise for the free movement of the shank of the screw. This method can be used by first placing the screws in the centre of the mortises when they will be free to move in either direction, with the movement of the face boards, under varying conditions.

Metal Plates

An improvement on that given is to use small plates of iron or brass, brass being preferred. These plates can be purchased, and are fitted

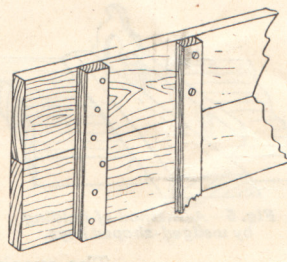


Fig. 2—Cross battens secured with screws.

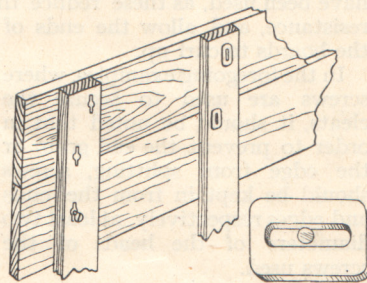


Fig. 3—The use of a metal plate.

either by sinking them in flush with the surface of the cleats, or by laying them directly above the mortise holes, placing the screws when they are driven, in the centre of the slot in the plates. It will be found that the screw heads move freely upon the plate with variations in the width of the boards. Round-head screws should be used in fixing these plates.

A more costly, though very satisfactory method to prevent warping is shown in Fig. 4. Before the cleats are fixed, by the method already described,

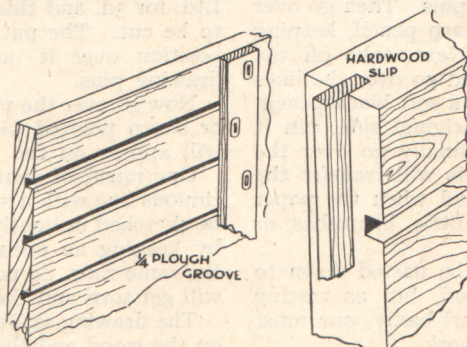


Fig. 4—The grooved underside and cleats.

where plates are used, grooves are worked upon the underside of the board. The depth of these grooves is governed by the thickness of the timber, and should rarely exceed one quarter of the thickness of the timber in depth.

The width of the groove may vary, though from a practical viewpoint a narrow groove is as efficient as a wide one. Both serve the purpose of confining the expansion and

To Prevent Wood Warping—(continued)

contraction of the board to the distances between the grooves.

It is recommended that the width of the grooves should be $\frac{1}{4}$ in. or less, but the distance apart is governed by the width of the board. In practice, the more grooves the better, consistent with the fact that the board shall not be unduly weakened. This method is often still further improved by inserting in the ends of the boards hardwood "slips."

The position of these "slips" is usually central, and the sizes conform roughly to the following practical rule. The width of the slip is to be equal to one half the thickness of the board. That is, when the whole of the slip is to be inserted, the thickness of the slip should rarely exceed one-sixth the thickness of the board in which it is to be placed.

A Word about Screws

Many failures have occurred where slips of excessive thickness have been used, as these reduce the resistance, and allow the ends of the boards to curl up.

In the foregoing examples, where screws are used to secure the cleats, it should be noted that in order to prevent the end grain or the edge from splitting, screws should be kept in from the ends and edges respectively, at least two diameters of the heads of the screws used.

Dovetail Work

In Fig. 5 a very thorough method is shown. Dovetail keys are housed into the boards on the underside, and in some cases these keys finish flush with the surface of the board. More generally, however, they are allowed to project one half of their thickness. The keys are usually made from timber.

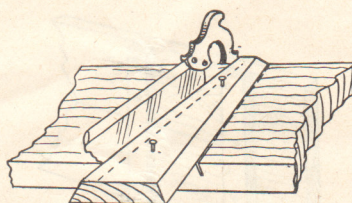
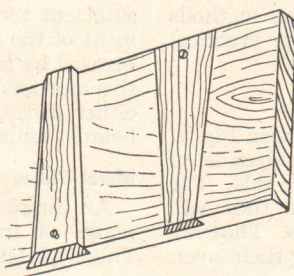


Fig. 5—A method of holding by wedged-shaped keys.

The proportions of the keys are outlined. In length they should taper not more than one in eight, with a minimum width at the narrow end of zins. The edge bevel need not be too acute; in fact it is a mistake to make it so as it tends to raise and split the board. A suitable bevel for both hard and soft woods is one in four.

Wedge Keys

In conjunction with Fig. 5 a practical method of forming the joint is shown. The keys are prepared first, splayed in their length and edge beveled.

Actually they should be in length a few inches longer than the width of the board. A key is placed upon the board, in its correct position and lightly nailed. Keep the narrow edge of the key flush with the edge of the board.

As can be seen, the key provides a guide for the tenon saw and ensures a good fit, whether the edge bevel is correct or not. The depth to which the " housings " are sunk for the keys is generally assumed to be one half the thickness of the board.

In practice, however, it is found such housings seriously reduce the strength of the board. On this score alone it is recommended that the depth to which the keys shall be sunk should not exceed one third of the thickness of the stuff to be keyed.

Spacing

The spacing of the keys varies with the class of work, but to fulfil their purpose in a satisfactory manner they should be spaced not more than 18 ins. apart, with the taper running in different directions as shown. The keys are not securely fixed by nailing or screwing, but to prevent their complete withdrawal it is advisable to drive a small nail or screw through the wide end into the board.

Art of Fretwork—(continued from page 598)

and almost any clean greaseproof paper will do. It is laid over the pattern to be traced, and the two held to a board with drawing pins. Then go over every line carefully with a sharp pencil, keeping accurately to the pattern. Next, take off the tracing paper, turn it over, and go over the lines again on the reverse side with a soft black pencil.

Then turn it back to its original side, pin it to the board to be cut and finally go over the lines with a hard pencil. This will transfer the pattern direct to the wood, and when the paper has been taken away, any little blemishes or omissions can be filled in.

Of course, the pattern can be pasted down to the wood when first traced off, but as tracing paper is apt to stretch and curl badly, one must take great care in doing this work.

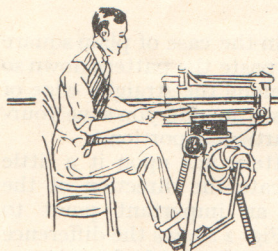
The other method of duplicating by carbon

paper is much more straightforward. Large sheets of suitable carbon can be obtained from Hobbies Ltd. for 3d. and this is laid on the board actually to be cut. The pattern or design is then laid in position over it, and the two held firm with drawing pins.

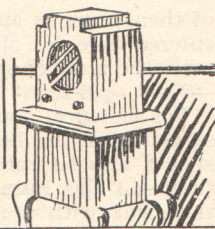
Now go over the pattern lines with a hard pencil or sharp pointed piece of wood and the outline will appear on the board exactly as drawn.

One must, of course, be careful to keep a continuous line with a steady hand. The lines cannot be sketched in lightly. One strong line is essential by keeping an even pressure on the paper. At the same time, do not press too hard or the paper will get torn and the pattern spoiled.

The drawing at Fig. 5 shows the layers of paper on the wood and the method of drawing over the pattern lines.



THE ART OF FRETWORK



HAVING spoken of the variety of wood and tools generally used in fretwork, we can turn to the designs which form such an important part of the art. There is so much in these that the worker is apt to take for granted, but which at the same time, means so much to ease his labour or to save him time.

Take, for instance, the green ink in which Hobbies patterns are printed. This is not just a fad or done for cheapness. It is an acknowledged fact that this colour is the most restful and the least trying to the eyes.

Saving Eyesight

A pattern which has to be followed carefully and keenly during the cutting will affect the eyes more if printed in black or blue or similar dark colours. In green, one has a definite line to work to, but at the same time, one which will not prove hard or tiresome even after a considerable period.

A special kind of paper is used, too, which will not be hard to get off the fretwood, but yet which will not stretch unduly when pasted down. One can see how the latter point would affect a design badly. If the paper stretched when dampened with the paste, a straight line would become crooked, or a nicely curved pattern would be quite untrue when put down.

Patterns are generally produced on large sheets

a suitable way in which they can be kept.

Notice that the design is so folded that the name and number always appear in the top corner, and are so visible for easy reference.

The number of the design, too, is always the same as that which appears on the front cover of Hobbies Weekly so it is quite easy to tell in what issue the working instructions appeared which relate to that particular piece of work.

7th ARTICLE

How to keep Designs—Why printed Green?—A Reference Book—Saving Wood and Space—How to Trace—The Use of Carbon Paper

The designs are folded flat, and should be kept in a suitable binder. One can easily be made of two plywood boards measuring $8\frac{1}{2}$ by $6\frac{1}{2}$ ins. and $\frac{1}{4}$ in. thick. They can be covered with fancy paper or leatherette stuff turned inside and parted flat. The boards can then be kept together by means of fancy cord or strong

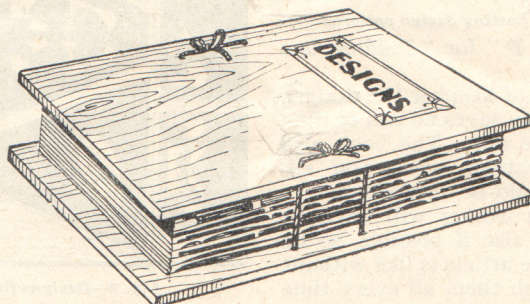


Fig. 1—A useful design case.

string run through at two points well apart on each side and tied in a bow. The binding card should not pass through the designs themselves. The cover can have suitable wording printed on, or a small label of "Hobbies Designs" cut from a spare sheet and pasted on. A picture of such a binder is given at Fig. 1.

A Catalogue

Then, for ease of reference, a catalogue book should be kept. The designs are put in the binder as described, and a correct note

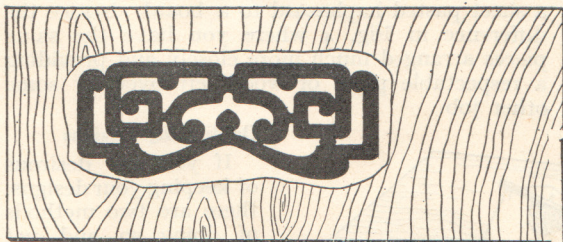


Fig. 2—The grain of the wood helps to strengthen the part if running correctly.

and are given away with Hobbies Weekly. They are, of course, also obtainable separately, if required. Regular readers thus accumulate a large number and a great variety of pattern sheets, and it is worth noting here, in passing,

The Art of Fretwork—(continued)

of them made in an index book. They should be entered here in alphabetical order of subjects with the number against each. Like this, "Cruets—Nos. 1948-2050" and so on.

For instance, you will have a whole lot of designs under the heading of "Models," but each should also be entered under its proper name—Cranes, Doll's Furniture, or whatever it is. Just the same with musical instruments. They all, naturally, come under the letter "M" in the index, but you should also show them as under

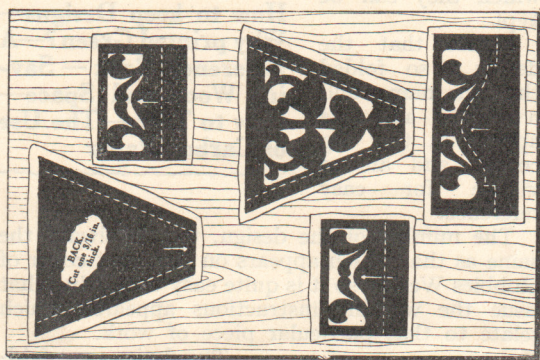


Fig. 3—A wasteful method of pasting design patterns.

"U" for "Ukulele" or "F" for "Fiddles, one string," etc.

This methodical method of keeping the designs and a catalogue book of them saves no end of time when you want to get one out. The book also serves as providing suggestions when you are soliciting orders from would-be customers.

Of course, the thorough worker will have an illustration of each article also if possible, so he can see at a glance what the article is like without the trouble of going through them all every time he wants one.

Saving Time

Most patterns are printed full size on the Design Sheet, and so are ready to paste down to the wood. They are cut from the sheet with scissors, running fairly close to the pattern, to save a lot of waste paper being pasted to the wood.

In some cases, of course, the patterns are plain rectangles, and in such case there is no need to paste them down at all.

Put the paper on the wood, and fix it temporarily with drawing pins. Then take a strong pin or sharp awl or pricker and carefully make a hole through the exact corner of the pattern into the wood. Take the paper away again and connect up the pin holes made, with a sharp pointed pencil. This method saves the trouble of pasting the paper down, and afterwards glasspapering it off. Another means of

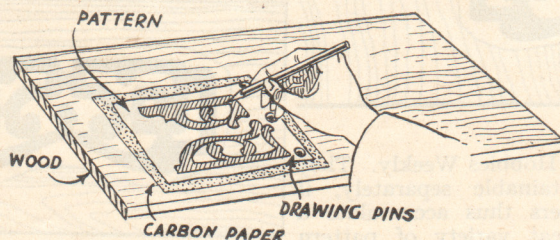


Fig. 5—How to duplicate a design by means of carbon paper.

saving time and cutting in the case of plain square pieces, is to mark off, or paste the pattern down so the straight edge comes along the straight edge of the wood. Get the lines true, and you save yourself the cutting of that particular portion.

Notice that every pattern has upon it a little arrow. This is to indicate the direction of the grain of wood and is an important point to remember. A glance at Fig. 2 shows the difference it makes in the strength of the finished part.

The Grain

The long design pattern should have the grain running along at its greatest length as at A. At B, the pattern has been pasted down across the grain, and it will be realized how much weaker the part is and how much more liable it will be to snap, when cut out.

These two illustrations, by the way, also show how *not* to paste down a pattern. They are put right in the middle of a good piece of wood, so that a great deal of it will be wasted.

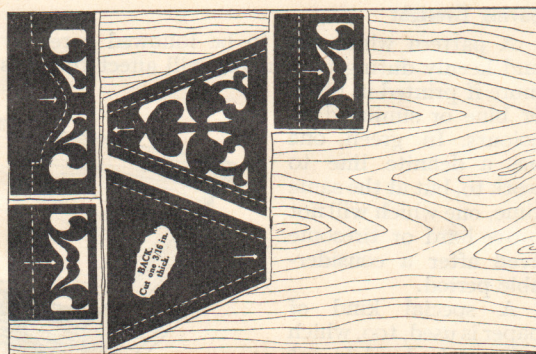


Fig. 4—Designs fitted for saving in wood.

Far better to put the pattern near the edges to allow a greater piece to be left for further use.

It is a good plan to sort out all your patterns to be cut, from a particular thickness of wood. Then cut them out roughly with the scissors and arrange them on the board in the most economical way.

Look at Fig. 3. Here you have the parts of a sheet pasted haphazard to a board. Notice the difference in Fig. 4 where you have the same pieces arranged much more closely and providing a respectable piece of wood left over for some other job.

Duplicating Designs

If you are desirous of keeping your designs, there are two methods of doing so and yet using them. One is by tracing paper, and the other is by use of carbon duplicating paper.

Tracing paper, is, of course, transparent, (Continued on page 596)



THE average amateur photographer is inclined to be too conventional. He "takes" the usual bevy of "snaps" in the summer, pastes them in an album or gives them away and at that, lets things rest. He does not realise how inexhaustible are the possibilities of his hobby or the resources of his camera, even though it may be an inexpensive humble affair.



An example of what can be done.

By exploring unusual ways and getting off the beaten track, the possessor of any type of apparatus can amuse himself, interest and gratify his friends and even save money on occasion. There is no phase of the pastime which is more fascinating than that which permits the production of studies whose variety is legion and novelty unlimited. Silhouette work requires little or no skill above the usual. It is, indeed, easier to produce a striking "shadow" photograph than it often is to turn out an ordinary landscape or portrait. But whereas the purpose of a conventional photograph is to convey detail, that of the silhouette is to create an impression. An impression cannot always be utilised to take the place of a print containing detail, but those occasions upon which it may be used are marked by a suitability which is very definite.

From a Parachute

For instance, a portrait, taken and printed in the usual way, and pasted upon a suitable card or mount, will afford pleasure, when despatched, to a friend, in the form of a seasonal greeting card. But it would not only please, but interest its recipient if it were portrayed in silhouette. This is only one way in which this branch of the hobby can be utilised. There are many others.

The resourceful amateur can devise adjuncts

and accessories, mainly cut from cardboard, these being associated with a person, the combination being portrayed without disclosing any feature that would differentiate the actual from the improvised.

An ordinary sized head can be photographed with a gigantic pipe, a standard sized body with enormous hands, a small face with a big nose, or a diminutive body with a big head. By cutting from board a design to resemble a parachute it is even possible to produce a silhouette which makes it appear as though the subject were dropping from the sky.

The purpose of this article, however, is not to suggest novel applications of this style of photography so much as to show how easily silhouette work can be carried on. It is just a case of working dead against the light under suitable conditions. These conditions can always be arranged.

The main requirement is a frame of zinc, by $\frac{1}{2}$ in. wood; the larger this is the better. Over it is stretched some white gauze to present an absolutely smooth and unruffled surface. The butter muslin as used to protect edibles during hot weather is very suitable. An alternative plan which can be employed when large window panes are available is to paste white tissue paper over the glass.



Another striking and unusual portrait.

The photographer has to do no more than to place experimentally a sitter in front of this "background" in order to gain a comprehensive working idea of the whole scheme. With his naked eye he will be able to observe an effect which will be enhanced by the

Silhouette Photography—(continued)

camera and can be elaborated by judicious printing on appropriate sensitized paper.

Obliterating Framework

Some modern windows consist of many small panes latticed by steelwork which, unless deleted from the background, would invariably spoil the effect it is aimed to secure. In order to eliminate

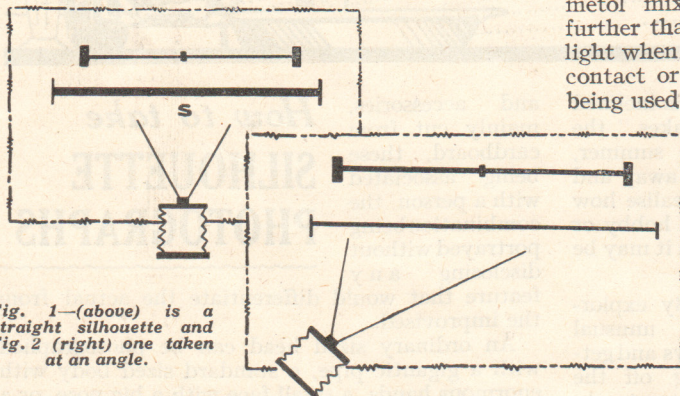


Fig. 1—(above) is a straight silhouette and Fig. 2 (right) one taken at an angle.

this risk, it is essential to use a screen rather larger than would ordinarily be required and to place it at that distance from the window which will enable the sitter to be sharply focussed while allowing any shadows that may be cast, to merge themselves into the white of the material.

If, when the print is made, it is developed so the resulting picture will be "hard" the background will be perfectly white while the figure will be black. It is generally possible to select a window whose design is such as permits the screen to be placed quite near it.

It is necessary that the light by means of which the plate is influenced must come from one direction only and that, of course, is from behind the sitter. If there is any light behind the camera, more than what is always present in an ordinary room, it may spoil the effect entirely. But this condition rarely arises except when there are two windows facing each other. In such an instance one can be covered while the other is being used.

How to get to Work

Having positioned the screen so there are no shadows upon it, place the sitter about one foot from it. Focus on the subject in the usual way and then stop down the lens till a point is reached, where any detail of clothing must necessarily be underexposed

when the shutter is actuated just quickly enough to fully expose the high light which is the background.

In a normal room, round about the middle of the day, an exposure of half a second—just on and off—is sufficient when the working aperture of the lens is F 16.

Development is best done with a fairly weak metol mixture and must not be carried any further than is necessary to produce a clean high light when the negative is printed. This can be by contact or through an enlarger a "hard" paper being used. When developing the negative or the print there must not be any forcing or the whole effect will be spoilt.

A Variation

Fig. 1 shows the disposition of the window, screen, camera and sitter when a "dead-on" silhouette is to be made. A very pleasing variation can be made by altering the disposition of the sitter and the camera as indicated by Fig. 2.

It will be noted that the sitter is now placed well to the left of the screen, while the camera is directed from a point also well to the left. The purpose of this arrangement is to endow the silhouette with a very fascinating shading which is just enough to indicate detail adjacent to the outline.

If the sitter's hair is glossy or grey, or if the face has been anointed with vaseline—perhaps under protest!—a delightful artistic effect will be secured.

NATURE NOTES

RULER OF THE MOUNTAINS

AS the eagle is such a "rara avis" as far as Britain is concerned—it does build its eyries still in the highlands of Scotland—the buzzard can claim to be our largest bird. With a wing span of about five feet, it reigns supreme over the Lakeland fells and the mountains of Wales.

Its flight is most majestic, with its circling sweeps round the highest of screes, where the storm winds howl, and its musical calling or mewing, harmonises well with the winds. Its wings seem motionless as it sails round the rocks, and the tips of them turn up, to give the noble bird an individualistic appearance.

Like other members of the hawk family, it is always on the alert for its quarry—rabbits, rats, mice and birds—and when its keen eye marks its prey, the huge wings shoot upwards and the buzzard drops like a stone on to its victim, soaring away with it to some impregnable height to tear it in shreds.

Like the eagle, the buzzard builds its crude nest in a crevice

or on a ledge of the rocks, well beyond the reach of humans. Its domain is in the highest heavens, round the weather-beaten tops of our wildest mountains, Helvellyn, Saddleback, Skiddaw, Conister Old Man, Weatherlam, Langdale Pikes, and such like.

A.S.M.



A SMALL WORKING LOOM

Concluded
from last
week's issue

An actual piece of work which enables you to knit ties, etc. A parcel of all parts is supplied by Hobbies for ease in making.

HAVING carried the work as far as this, we can continue with the construction of the loom and get on with the reed and comb.

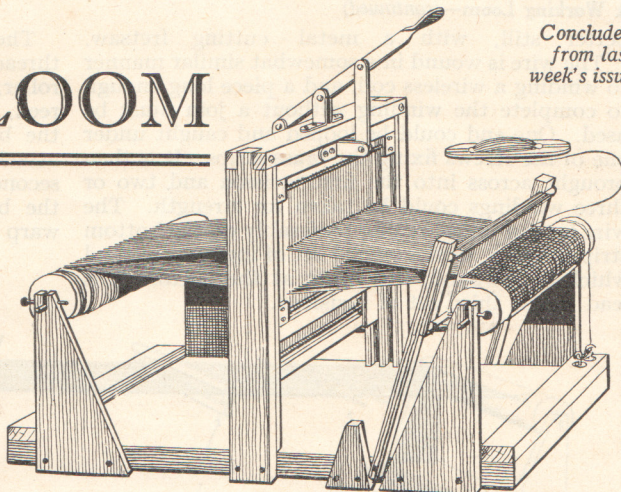
Two brackets are pivoted to the middle hole in the lever with a rivet, the couplings are pivoted to the other two holes, and two brackets are pivoted to the other ends of the couplings.

The brackets on the lever are screwed above the top bar, and the brackets at the ends of the couplings are screwed to the top of the heddle frames. It should be seen that the frames are worked properly by the lever, and that they move freely in the grooves, which should be slightly greased.

The Reed or Comb

As before mentioned, the loom is capable of weaving with about 24 warp threads to the inch. A beginner, however, should start on coarser stuff, using less and larger threads. The number of heddles may be easily adjusted, but separate reeds will have to be provided according to the number of threads to the inch. So, for simplicity of weaving and the easy construction of the reed, it is better not to complicate matters before experience is gained.

A method of making the reed is shown at Fig. 6. The main frame has two sides $7\frac{1}{2}$ ins. long by $\frac{1}{2}$ in.



WOOD SUPPLIED

Parcel No. T.M. 283 contains beech, turned rollers, rod, brass strip, screws, wire, hooks, for making the Loom. It costs only 10/- post free.

wide by $\frac{1}{4}$ in. thick, joined by a single cross strip $6\frac{1}{2}$ ins. long of the same section. The reed is built up on a separate frame made with two sides 3 ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{4}$ in. thick, across which two strips $6\frac{1}{2}$ ins. long by $\frac{1}{4}$ in. square are screwed. See that this frame is quite square, and that the joints are securely glued and screwed.

The reed itself could be of strong waxed thread, but as this soon wears with use, it is advisable to have fine wire. For strength and accuracy in marking it is necessary to fit strips of brass $5\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{16}$ in. thick above and below the reed frame, round-head screws at the ends being used to hold them in place.

A length of 4 ins. should be carefully marked on the brass, and divided up into $\frac{1}{4}$ in. lengths. For a start it may be advisable to use say 16 warp threads to the inch, so each of the $\frac{1}{4}$ in. divisions will be divided into four.

Marking Off

Marking should be carried out with care, and the dividing lines could be squared across the strips with a pointed steel scribe. To enable the wire to be wound and spaced correctly, make small incisions in the edges of the brass. This is done with a small triangular file, or,

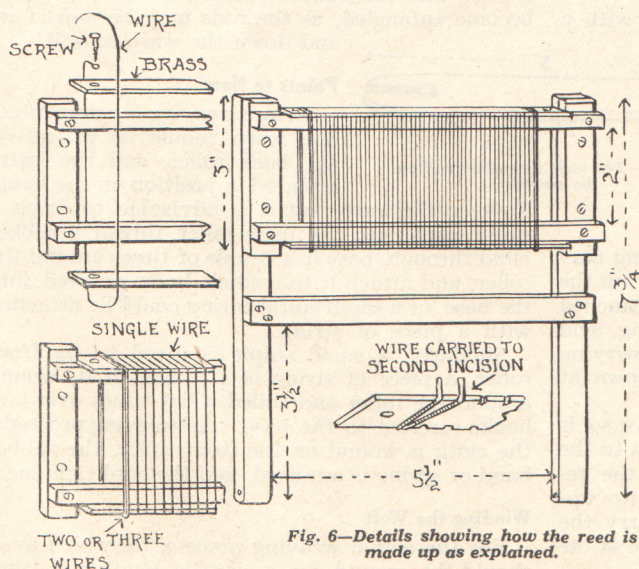
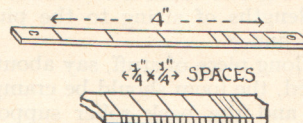


Fig. 6—Details showing how the reed is made up as explained.

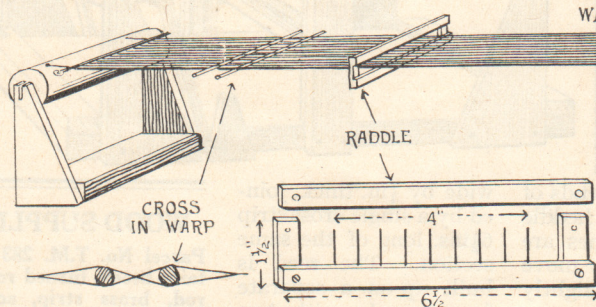


DIVIDED INTO FOUR FOR 16 WARP THREADS TO THE INCH, OR MORE AS REQUIRED.

A Working Loom—(continued)

better still, with a metal - cutting fretsaw.

The wire is wound in a somewhat similar manner to winding a wireless coil, and a piece long enough to complete the winding without a join must be used. One end could be looped and caught under one of the screws fixing the brass strips. It is then brought across into the first incision and two or three windings could be taken for strength. The wire is then taken across, preferably on the bottom strip of brass, to the second set of incisions around which it is wound, and again at the bottom it is lead to the third set of incisions.



The winding is carried right across in this way, and in finishing, the wire should be caught under the head of one of the screws at the other end.

The result will be a reed with parallel openings on both sides through which the warp threads will pass. When the reed is fairly coarse, the wires may be retained on both sides, but for finer work, those at the back sometimes complicate the threading of the warp.

If this is found to be the case, a line of solder may be run along all the edges of the brass strips to fix the wires, and those at the back, with the exception of the strengthened ends, may be cut away. Some may prefer to solder the wires in any case.

The reed is screwed to the main frame with a couple of screws at each side. Two screws are used to pivot the latter to the base, and wood stops of triangular shape should be fitted to the edges of the base to hold the reed when it is pushed back.

Weaving with the Loom

This having been done, the actual weaving may be considered. The first operation is to set up the warp threads. They may be conveniently attached to the rollers with a wire pin about 5ins. long, held by driving two tacks into the rollers and carrying short lengths of string to the pins, as shown at Figs. 4 and 7.

If a long piece of stuff, say about a yard or so, is required, the loom should be cramped down to the table, and the back roller supported at the required distance on a frame made with two uprights corresponding with those which carry the roller in the loom, and joined by a crosspiece at the bottom.

The threads are then set up, they may be threaded on a needle, the first is fixed to the front roller, passed through the first opening in the reed, the first heddle in the front frame, and so to the back roller. The second thread is similarly attached to the front roller, passed through the second opening in the reed and the first heddle in the back frame. This is repeated until all the warp threads are in place.

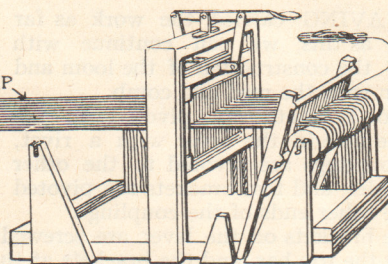


Fig. 7.—The loom in use with details of the raddle.

A frame—called a raddle—conveniently divided by cross wires will greatly help in setting up the warp. That shown at Fig. 7 has bottom strip $6\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{4}$ in. thick, screwed to two uprights $1\frac{1}{2}$ ins. long. A length of 4ins. is divided by short wires into $\frac{1}{2}$ in. or $\frac{1}{4}$ in. spaces, and holes or a groove is cut in the bottom edge of a top strip to allow it to fit down over the wires, and be attached to the sides of the frame with a couple of screws.

When setting up the warp, the threads are equally divided in the divisions of the raddle, and if it is moved up and down the length of the warp it will help to distribute the threads equally.

Another point which may be considered is crossing the warp on two small rods, also shown at Fig. 7. This makes it impossible for the threads to become entangled, as the rods may be moved up and down the warp at will.

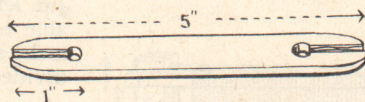


Fig. 8.—The weft thread wound on the shuttle.

Points to Note

Before weaving is commenced, the warp should be wound on the back roller, and the latter is placed in position on the loom.

To keep the warp taut it is advisable to drive a small staple into the back roller, thread a rubber band through, pass it a couple of times around the roller, and attach it to a small hook screwed into the base, or a small spiral spring could be attached with a piece of string.

Similarly, a small staple is fitted to the front roller, a piece of string is attached to it, wound around the roller and coiled a few times over two hooks screwed to the base. As weaving proceeds, the cloth is wound on the front roller, the rubber band or spring is adjusted, and the cord tightened.

Winding the Weft

For the actual weaving process, the weft thread should be wound on a shuttle similar to that

A Working Loom—(continued)

shown at Fig. 8. It is made from a piece of wood 5ins. long by $\frac{3}{4}$ in. wide by about $\frac{1}{2}$ in. thick. Holes $\frac{3}{8}$ in. diameter are bored 1in. in, slots $\frac{1}{4}$ in. wide are cut from the ends, and the latter are rounded. The weft thread is tied to the outer warp thread, the lever is brought into action to form the shed for making the first cast of the shuttle, the lever is reversed for the second cast, and the reed is brought into action to press the weft threads well together.

Many fancy designs may be devised by introducing two colours in the warp to form stripes, or

keep the cross in the warp as long as possible to prevent the threads from becoming entangled. Use the raddle, when setting up the warp, and keep it in place even after the threads have been wound on the roller, as it helps to keep the threads distributed evenly.

It may be easily removed when not required by running out the two screws which fix the top strip. Thread heddles are, perhaps, more difficult to thread the warp into, but they certainly allow the frames to be worked with greater ease as they do

CUTTING LIST

Beech
1 piece 1ft. 4ins. long by 5 $\frac{1}{2}$ ins. wide by $\frac{3}{4}$ in. thick (for base).
2 pieces 5 $\frac{1}{2}$ ins. long by 1in. wide by $\frac{1}{2}$ in. thick (for strengthening slips).
4 pieces 6ins. long by 3ins. wide by $\frac{1}{2}$ in. thick (for uprights to carry rollers).
2 rollers 5 $\frac{1}{2}$ ins. long by 1 $\frac{1}{2}$ ins. diameter.
2 pieces 10 $\frac{1}{2}$ ins. long by 1 $\frac{1}{2}$ ins. wide by $\frac{1}{2}$ in. thick (for uprights).
1 piece 6 $\frac{1}{2}$ ins. long by 1 $\frac{1}{2}$ ins. wide by $\frac{1}{2}$ in. thick (for cross-bar).
6 pieces 10ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (to form grooves in upright).
8 pieces 5 $\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (for heddle frames).
1 piece 6ins. long by $\frac{3}{8}$ in. wide by $\frac{1}{2}$ in. thick (for clips in heddle frames).
2 pieces 7 $\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (for sides of reed frame).

1 piece 6 $\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (for cross piece of reed frame).
2 pieces 3ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (for sides of reed).
2 pieces 6 $\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. square (for cross-strips of reed).
2 pieces 9ins. long by $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick (for raddle).
2 dowel rods $\frac{3}{8}$ in. diameter (for crossing warp, and forming rods).
1 piece 5ins. long by $\frac{3}{8}$ in. wide by $\frac{1}{2}$ in. thick (for shuttle).
2 doz. brass screws 1in. by 3 (for fixing uprights to base).
3 doz. screws $\frac{1}{2}$ in. by 2 (for fixing heddle and reed frames).
2 doz. fretwork screws $\frac{1}{2}$ in. long with round heads (for fixing lever, etc.).
2 pieces of wire about 5ins. long by 1/16in. diameter (for pins on rollers).
3ft. 6in. length of $\frac{1}{2}$ in. by 1/16in. brass (for lever, etc.).
3 hooks No. 122.
150ft. of fine strong wire (for heddles and reed).

two colours in the weft, or both. If two colours are used in the weft, it is necessary to have two shuttles, and use each alternately.

A loom of this type is useful for many small woven articles, such as scarves, ties, belts, etc., but from the instructions given it will be a simple matter for the enterprising worker to construct a much larger machine, if he so desires.

Points which should be observed by the beginner are not to attempt too much at the start. Always

not occupy so much space as wire.

On the other hand wire is better for winding the reed as the latter is subject to a considerable amount of wear when it is worked forward and back between the warp threads. As work proceeds, it will be necessary to make up several interchangeable reeds for different numbers of warp threads per inch, as required. All may be made the full width of 4ins. even if narrower work is in hand at the moment.

HOBBIES of WELL-KNOWN PEOPLE

Interesting and Intimate details of George Robey

OVER the mantelpiece in my study hangs a photograph of George and myself taken with a former Lord Mayor and Lady Mayoress of Cardiff. It was in connection with a Y.M.C.A. charity appeal and tells its own tale of one of the great comedian's greatest hobbies—helping others to help themselves.

The Prime Minister of Mirth is 65 now, but he is just as keen about his profession as any comedian anxious to make a name for himself. His home life is true to its name—Robey is a homely man who does not regard home as just somewhere to go when every other place is closed down. And why should he?

Like many Hobbies Weekly readers, he is an enthusiastic collector of things. He collects

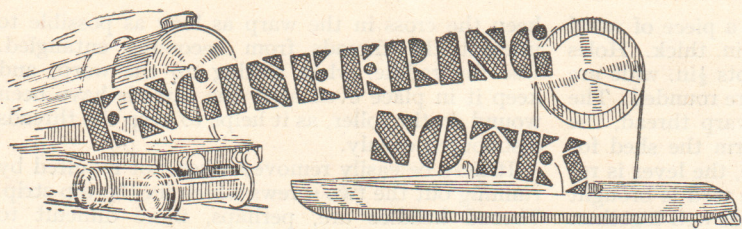
stage souvenirs and goes into flights of boyish ecstasy as he shows his fine collection of rare stamps.

And what about the Robey violin factory which he has, tucked away at the back of his house? George has made some beautiful instruments and one of these bears Kreisler's autograph. Out of doors, George Robey plays cricket and golf and likes to wander round the Zoological Gardens in his neat blue pin-striped suit. Few theatrical celebrities are as free as Robey from superstitious beliefs. He scorns the very idea of a mascot.

The only things he takes about with him are his famous eyebrows. He cannot get away from them. Nor can we.—G.G.



Look out for further people in this popular feature!



A Triumph for Steam

HOW thrilling to think that the first steam locomotive in the world to achieve a recorded speed of 100 m.p.h. has turned out to be no other than the world famous No. 4472 *Flying Scotsman* of the London and North Eastern Railway!

The old steam speed record of 102.3 m.p.h. set up by the Great Western engine *City of Truro* in 1904 has just been discredited. After six months' study of facts and figures, railway experts have shown that the speed on this historic occasion cannot have exceeded 96 m.p.h.

The new record was set up during the course of two grand test runs recently organized by the L.N.E.R. to take place between London and Leeds. The purpose of these runs was to prove that a well designed steam locomotive could maintain very high speeds over long distances, and thus show that the diesel-oil type of train could not win its way into this country on grounds of speed superiority.

As brief particulars of the runs will show, the L.N.E.R. got the proof they wanted!

Driver Sparshatt, one of England's most famous enginemasters, was allowed to go just however hard he liked with No. 4472 *Flying Scotsman*. He travelled 185.7 miles from King's Cross to Leeds, with a light 147-ton 4-coach train, in 152 minutes. A maximum speed of 94½ m.p.h. was attained. Despite several slowings for junctions and a number of severe hill-climbs, the average rate was no less than 73.4 m.p.h.

Before the return trip was commenced, two coaches were added to the train, bringing the load up to 207 tons behind the tender. Undismayed, however, Driver Sparshatt and Fireman Webster fought home with *Flying Scotsman* at another first-class average of 70.9 m.p.h. Better still, they attained a maximum of precisely

100 an hour on a falling grade near Little Bytham.

Never in history, despite all American and British rumours to the contrary, has the 100 m.p.h. mark previously been touched by a steam locomotive under authentic conditions. *Flying Scotsman's* speed was automatically registered upon instruments of undoubted accuracy in a dynamometer recording car attached to the test train. Just to make sure, the rate was checked by experts with stop-watches.

When *Flying Scotsman* steamed triumphantly back into King's Cross, she had, on that one day, covered 250 miles (out of a total of 371 miles) at an average speed of 80 m.p.h.—a record of records!

A Gauge "O" "No. 10,000"

AT a Manchester exhibition an elaborate working model "O" gauge electric railway, supplied and designed by the Miniature Exhibition Railways Company, of Dundee was given. Among many fine true-to-type models was

Interesting News on Railways Real and Model

By High Pressure

corridor coaches at speed with the greatest of ease.

Snow Ploughs for L.M.S.

TWENTY-FOUR new snow ploughs are to be provided by the L.M. and S. Railway this winter, largely in replacement of existing equipment now out of date. The new ploughs will be of the simple sheet steel type, for attachment to the front of locomotives.

These are distinct from the more elaborate and larger ploughs, which are affixed to the front of special snow plough vans, pushed from the rear by an engine. Fifteen of the new L.M.S. ploughs will be used in Scotland, between Perth, Inverness and the Far North.

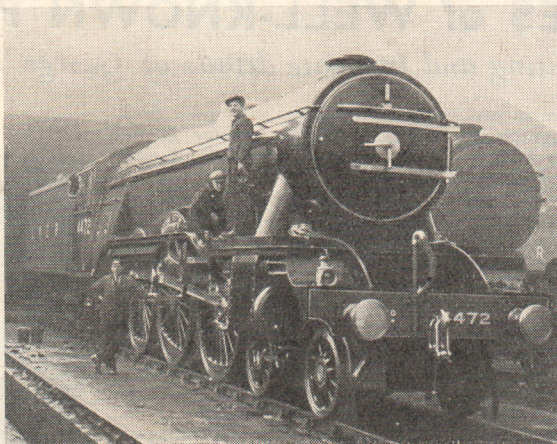
This section of line includes the crossing of the Drumochter Pass, at a height of 1,484 feet above sea level, which is the highest altitude reached by any main line in Britain. The nine other ploughs will serve in Northern England, South Wales, and Derbyshire.

S.R. Loco Chimney Experiment

THE Southern Railway have just fitted their *Lord Nelson* type express engine No. 862, *Lord Collingwood* with a double exhaust pipe, or "blast" pipe, and a double chimney similar to that fitted to the L.N.E.R. *Cock o' the North*.

This double blast pipe and chimney, called the *Kylchap* type, originated on the Paris-Orleans Railway of France. The effect is to produce the freest possible exhaust, and the most uniform action on the fire. As many readers will know, the chimney exhaust of a railway engine is, in a roundabout way, used to draw the fire. *Lord Collingwood* now has a novel appearance as a result of the elongated chimney.

Readers who have an opportunity should make a point of noticing this peculiarity. They will find it most interesting.



The *Flying Scotsman* being prepared.

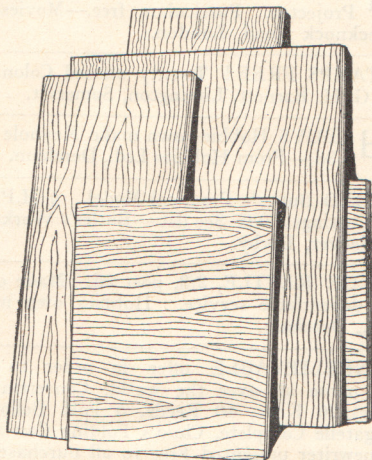
one of the ponderous grey-coloured 4-6-4 "Hush-hush" engine, the L.N.E.R. No. 10000. This super-detail model was complete with all cab fittings, intricate Walschaert's valve-gear, and corridor tender. It could haul twelve

PLYWOOD

Plywood will never entirely supplant solid woods like oak, mahogany and walnut, but it is ideal for certain jobs such as panelling, jig-saw puzzles, etc. For all your plywood requirements, try Hobbies first. You get good value—and a square deal.

FREE—

A list of plywood, fretwood, stripwood, etc. is yours for the asking. Call at any Hobbies branch or write to Hobbies Limited, Dereham, Norfolk, for a copy.



CHEAP BIRCH

We can recommend this plywood for general use. It can be easily stained, but is not guaranteed free from knots.

$\frac{1}{8}$ in. 48 in. \times 24 in. (8 sq. ft.) .. Price 1/9
24 in. \times 24 in. (4 sq. ft.) " 11d.

Special sizes at 3 $\frac{1}{2}$ d. per sq. ft.

These panels are too large for parcel post and are sent carriage forward.

$\frac{3}{16}$ in. 60 in. \times 48 in. (20 sq. ft.) .. Price 4/6
30 in. \times 48 in. (10 sq. ft.) " 2/3
24 in. \times 12 in. (2 sq. ft.) " 6d.
16 in. \times 16 in. (1 $\frac{1}{2}$ sq. ft.) " 4d.

Special sizes at 4d. per sq. ft.

POSTAGE 24 in. \times 12 in. panels—1 for 6d.; 3 for 9d.; 5 for 1/-; 7 for 1/3. 16 in. \times 16 in. panels—2 for 6d.; 5 for 9d.; 8 for 1/-, 11 for 1/3. Larger panels carriage forward.

THIN PLYWOOD PANELS

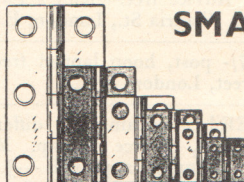
$\frac{1}{32}$ in. 18 in. \times 12 in. (1 $\frac{1}{2}$ sq. ft.) .. Price 4 $\frac{1}{2}$ d.
36 in. \times 12 in. (3 sq. ft.) " 9d.
 $\frac{1}{16}$ in. 24 in. \times 10 in. (1 $\frac{1}{2}$ sq. ft.) " 5d.
48 in. \times 10 in. (3 $\frac{1}{2}$ sq. ft.) " 10d.

It is best to order these thin panels with thicker boards as the cost of postage, if sent alone, is almost as much as the panel itself. The 48 in. \times 10 in. panel is too large for post and is sent carriage forward.



Your 1/- buys more during Hobbies Once-a-Year Sale. Order NOW from Hobbies Limited, Dereham, Norfolk. Sale ends March 30th.

SMALL HINGES



A packet of assorted Hinges (in pairs) suitable for fretwork and light carpentry. Value 1/6, Post 2d.

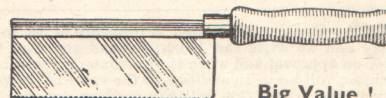
EGG-CUPS

Not an ordinary egg-cup this! Electro-plated with spoon to match. An amazing bargain. Buy all you need NOW. Post 2d.



SMALL SAW

Buy Now!



Big Value!

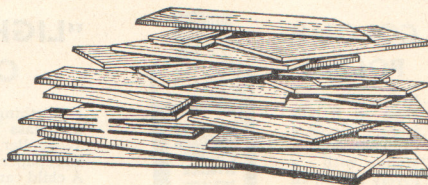
You need a saw like this to cut small beadings and mouldings. If we asked double this price you would still be getting sound value. Post 3d.

WARRINGTON Pattern HAMMER



A real 'he-man's' hammer. Cast steel head with polished hardwood handle. A hammer to serve you faithfully and well. Post 6d.

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MISCELLANEOUS ADVERTISEMENTS

The small "to sell" or "wanted" announcements appearing below are accepted from readers who want to sell anything except fretwork goods, or from usual advertisers of bargains of interest. The advertisements are inserted at the rate of 2d. per word. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Orders and Stamps must accompany the order. We cannot guarantee any date for these to appear, but they will be inserted in the earliest issue.

STAMPS, Disposing Stock, mainly pre-war, 50 different, 7½d.; no two packets alike.—D. H. Bates, The Mount, Basford, Stoke-on-Trent.

PATENTING Inventions. Advice free.—King's Patent Agency Ltd., 146H Queen Victoria St., London, E.C.4.

DRUM HEADS, 5/- or 7/- post, hoop lapped free.—"Potters," 36, West Street, London, W.C.2.

BUMPER PACKET FREE! Contains 100 different Stamps, including Pictorial, Scarce Stamp, Map, Ship, Native, Air mail, etc. Request approvals.—J. F. Smith, 19, Rougemont Avenue, South Morden, Surrey.

RETIRAL SALE. FREE, if Sheets asked during March, 100 different, includes Hawaii, Jubilee Cyprus, Confederate States, St. Helena, Sierra Leone. Cat. 1/—H. McAuslan, Stepps, Glasgow.

VENTRILOQUIST'S Doll, Smokes, Complete, 25/-, Bargain.—H. Brighton, "Graycot," Rectory Road Pitsea, Essex.

FILES FOR WOODWORK. A set of three costs only 2/3, post 4d.—From Hobbies Ltd., Dereham.

MOVIES AT HOME. How to make your own Cinema Projector. Particulars free.—Moviescope (H) 116, Brecknock Road, London.

STAMPS FREE! Twenty unused Colonials, "Neurope" G. H. Barnett, Limington, Somerset.

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GLUE KETTLE, 2/3, post 9d. Made of cast iron for dependable service. Hobbies own make.—Hobbies Ltd., Dereham.

UNBELIEVABLE offer in order to advertise our name all over the world: Concertinas, (Mahogany Case) 20 Keys, 40 Reeds, 5 Fold Bellows, 22/6 only. Bagatelle Complete, Child's Folding Carriage or Simplex Typewriter presented Free to all purchasers. State Gift when sending.—Lewis (Dept. 44), 34 George Street, Manchester 1. Limited to 100 Gifts. Send Now! No Waiting!

NOTICE.—Our Deposit System is probably of use to those desirous of seeing the goods before they buy. The would-be Buyer sends us his money and we write the Advertiser and give him the address of the person who wishes to buy. The goods are sent by the Advertiser to the Buyer on approval and when the purchaser gives us his consent we will forward the money to the Advertiser in payment of the goods which the purchaser will keep. In addition to the value of the goods, a Deposit Fee of 1/- must be enclosed to cover cost of our correspondence. Each party in the transaction will pay carriage one way. We cannot accept goods for exchange, nor any money for goods valued at less than 5/-. All money should be sent by Registered Letter, but we cannot be responsible for any damage or loss incurred. All letters to be addressed to the Advertisement Manager, Hobbies Ltd., Dereham, Norfolk.



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Hobbies Sale Bargains
FREE from Hobbies Ltd.
Dereham, Norfolk.



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5d.

If you prefer a water stain you'll like this. Stains deeply and evenly. In Brown Oak, Mahogany, Fumed Oak, Ebony and Walnut.

Post 4d.

COLOUR POLISH

Stains the same time as it polishes. Gives a deep penetrating stain with a lovely polish. In Mahogany, Walnut, Oak, Ebony.

1/6

Post 4d.

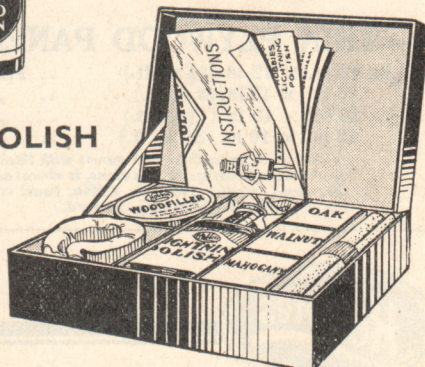


"LIGHTNING" POLISH OUTFIT

Everything you need to make a first-class polish job. Stains, Woodfiller, Rubber, Polish, Sandpaper and full instructions. A child can use it! A big bargain in the Sale.

1/9

Post 6d.



STAMP COLLECTOR'S CORNER

SOME NEW ISSUES

DURING the past month a new set has come to us from Trinidad and Tobago, and the values of these stamps has been changed to cents instead of pence and shillings. There are nine values in the new set—1, 2, 3, 6, 9, 12, 24, 48 and 72 cents—all with different designs. The stamp



chosen to be illustrated as a specimen is the 6c., and this shows the "discovery of Lake Asphalt by Raleigh in 1595."

TRINIDAD is not a very large island, being under 2,000 square miles in area, and having a total population of about 370,000—rather less than the number of persons in Bristol.

The chief town in the island is Port of Spain. Columbus discovered the island in 1498 and in 1588 it was colonized by the Spaniards, and it was in 1797 when England was at war with Spain that we took Trinidad. The asphalt lake as shown in the design is about 110 acres in extent and up to 20 feet deep, the edge solid but towards the centre it is decidedly viscous.



ANOTHER very interesting, though smaller set comes from Papua which is the south eastern part of the island of New Guinea. The north eastern part is the old German New Guinea,

while the western portion of the island is Dutch. Again, the stamp gives a somewhat wrong idea, or at least may do, because this set is to commemorate the fiftieth anniversary of the annexation. So the impression which may easily be gained is that it was not until that date (1884) that we had anything much to do with Papua.

Actually, Great Britain first had this colony in 1873. The reason for the discrepancy in dates is that although annexation was advised in 1873, the cost was stated to be too great, and the matter was dropped.

The 2nd and 5d. show a scene on H.M.S. Nelson, at Port Moresby. Now bring the glass to bear on the design of the 2d. stamp (illustrated) and you can read part of the famous signal of Lord Nelson.

THE Columbian stamp shown is somewhat like the previous 5c. issue, except that this appears a more peaceful scene, reminding one almost of a happy afternoon in an English fruit



orchard. The gentleman on the steps is gathering the fruit out of reach of the leisurely maidens below. Actually, of course, the scene is laid in a coffee plantation. Columbia is the largest producer of a mild type of coffee in the World, nearly all of which goes to the United States of America.

PRESUMABLY, most people were not surprised at the result of the Saar Plebiscite, and after the remarks in these columns which appeared a little while ago, you will be expecting to see an illustration of the special set which was bound to be issued by one of three parties.

Germany is, of course, the coun-

try which is responsible for the stamp shown. Four denominations complete the set—3, 6, 12 and 25 pfennig—and the design is the same in each case. It is of Ger-



mania welcoming back the Saar, and the inscription is "The Saar comes Home."

LASTLY, we come to the stamp from Manchukuo, a country which seems to be continually in the news. Here is one of four stamps just issued, and shows ears of Kaoliang—which is a type of



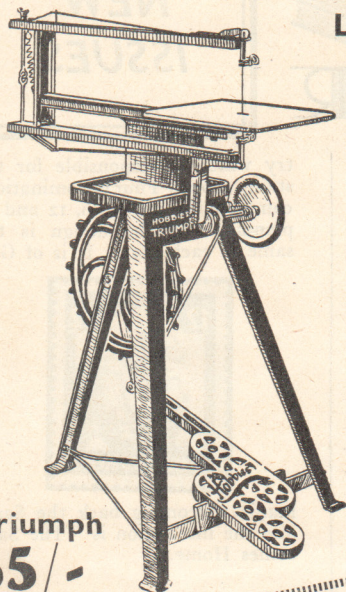
millet, and which with rice is the main food of the inhabitants, on either side of a conventional orchid.

NO doubt all readers by this time have seen an intimation to the effect, that a special set of stamps will be issued by all the colonies in connection with the Jubilee. Only one design will be used for all colonies. A portrait of King George and a view of Windsor Castle, and four denominations in common use, the highest value being the 1/- . The name of the territory will be the only thing to distinguish one from the other. They will be on sale from May 6th until December 31st.

Great Britain will also issue a set of four, ½d., 1d., 1½d. and 2½d. being the probable values and the issue will only be on sale for a relatively short time.

HOBBIES SALE

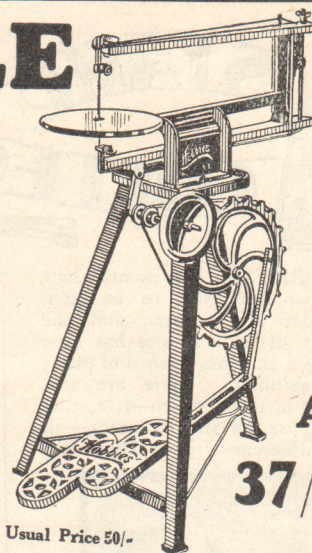
Last Day, March 30th



Triumph
55/-

Usual Price
75/-

Save while you spend ! Here is a wonderful opportunity to buy yourself a high-grade fret-machine at a fraction of the regular price. Remember, it pays over and over again to invest in a machine. Work is easier...output is bigger with consequent greater profit ! These machines are exactly as advertised in Hobbies Handbook and as supplied in the usual way.



A1

37/6

Usual Price 50/-

Buy Now and SAVE

FREE ! Get your copy of this Sale List. It shows hundreds of bargains too good to miss. Write to-day to Hobbies Ltd., Dereham, Norfolk, or call at your nearest Hobbies Branch. **HURRY !**

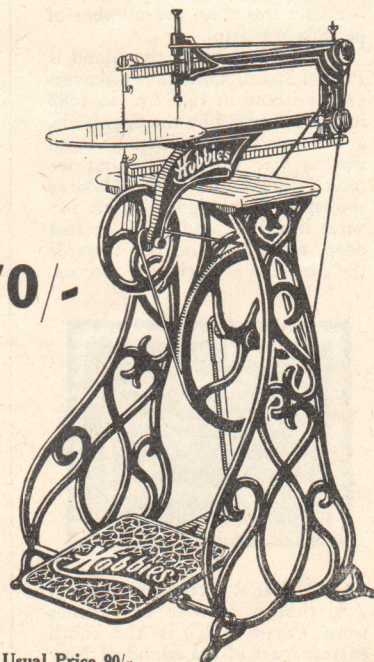


The IMPERIAL

Designed for the taller worker. 5½ ins. more room between treadle and table. The Imperial is a rugged machine built for lasting service. It incorporates a drilling attachment which is simple and positive in action...and a great time-saver ! One of the best bargains in the Sale.

70/-

Each machine is sent in a crate, ready for immediate use. Carriage forward from our Dereham factory. Give name of nearest railway station when ordering.



Usual Price 90/-

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GLASGOW - - - 326 ARGYLE STREET.
MANCHESTER - - - 8 PICCADILLY.
BIRMINGHAM - - - 9a HIGH STREET.
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54 WELLINGTON STREET WEST, TORONTO.

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DEREHAM, NORFOLK

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EDITORIAL.

All Editorial matter should be sent to The Editor, Hobbies Weekly, Dereham, Norfolk. If enclosed with orders or other matter for Hobbies Ltd., it should be written on a separate sheet of paper. Any matter requiring an answer must have a stamped addressed envelope enclosed.

DESIGN SHEETS.

The presentation Design Sheet is given only with current copies of Hobbies Weekly and not with back numbers. The designs, however, can be obtained separately, from Hobbies Ltd., price 4½d., post free, or 10d. in the case of double size sheets.

ADVERTISEMENTS.

All orders and letters respecting advertisements should be addressed either to the Advertisement Manager, Hobbies, Dereham, Norfolk or to 52 Bedford Street, Strand, London, W.C.2.

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An Index for any volume is obtainable for 4½d. post free, and Binding Cases to take a complete set of 26 issues (making the volume) are supplied for 1/6, or sent post free for 1/8. The Cases are in red linen with gold blocked name on the front. The Azabook Binder, to hold 24 copies which you can fix in yourself is 3/3 (3/6 post free) including two dozen fastening staples.

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CONTRIBUTIONS.

The Editor is always pleased to consider suitable articles for these pages, which, if accepted, will be paid for at the usual rates. While every effort will be made to return unsuitable contributions (if stamps for that purpose are sent with them), the Editor does not accept any responsibility for their loss.

SUBSCRIPTION.

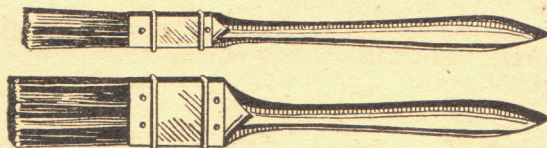
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Postage 1½d.			

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NOT AVAILABLE AFTER MARCH 30TH, 1935.
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Value

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This Voucher entitles anyone to goods value 2/6 FREE on any order over 10/- in sale prices for goods shown in the Hobbies 1935 Sale List. Fill in your name, with a list of gift goods required, and attach to your order. Add the number and value of the postal order, as well as your name and address.

Name

Address

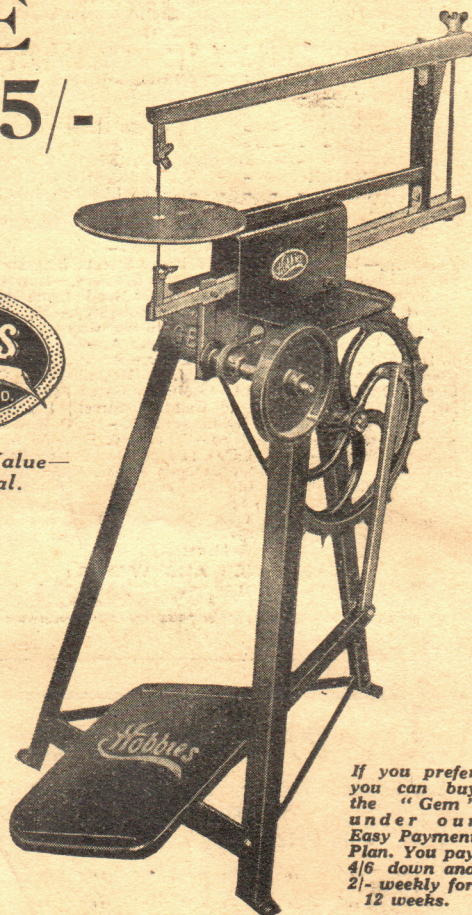
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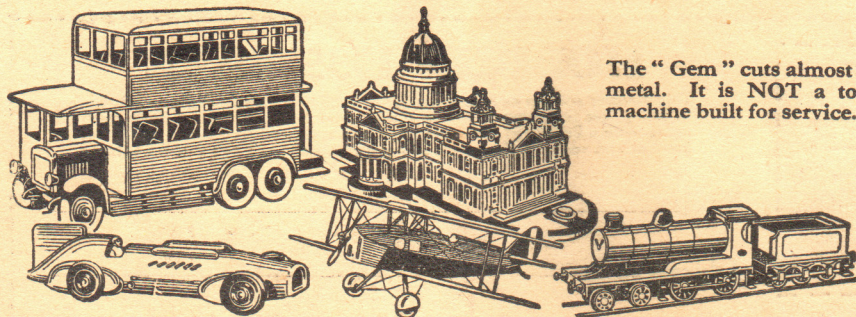


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